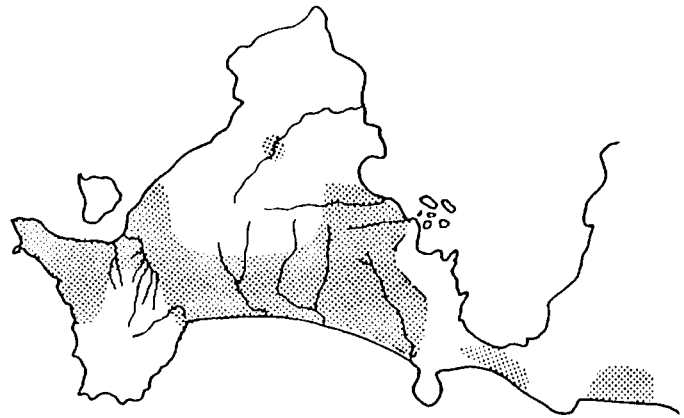

Figure 11: Concentrations of rhinotracks in 1967/1968/after: Schenkel and Schenkel-Hulliger, 1969)

partly based on the results of the rhino census of 1967 and 1968. A rhino-census is never undertaken in a period of continuous drought, since the tracks are only visible in more or less moist soil (Ammann, 1985). The lack of rhino tracks in the very suitable transitional zone to cultivated lands in the area east of the isthmus is easily explained by the shy character of the rhinos. For the relatively high density of tracks in the not very suitable western hills there is no clear explanation. The high density of tracks there as suggested by Schenkel is not confirmed by the results of Sajudin et al. (1984) or Ammann (1985).

Another point of difference is the Tereleng peninsula, protruding from the south coast, which is classified as moderately to very suitable. Schenkel does not indicate concentrations of tracks there, but Ammann (1985) does. Haerudin et al. (1984) even mention the tracks of four individuals concentrated on this relatively small area.

However, the major point of difference is the status of the very central part of Ujung Kulon, i.e. the dissected plateau mainly covered with rattan shrublands, roughly north of the line Cijung Kulon-Cigenter. On our map this area is part of the largest coherent surface of very suitable terrain, but Schenkel does not indicate a high density of rhino tracks, neither do Haerudin or Ammann mention the area as a densely populated rhino region. Even so, the area fully answers Ammann's description of an optimal rhino habitat viz. 'large areas of shrubland (....) with patches of forest, clumps of trees and other types of vegetation in a fine mosaic-like pattern'. As indicated in fig. 11a and 11b neither accessibility nor availability of freshwater are limiting factors in this area. Moreover, as was explained above, Schenkel's map reflects the distribution of rhinos at a time of year when lack of water is not a factor of great importance throughout Ujung Kulon. The solution to this problem is thought to be: the area is not covered sufficiently during a rhino census. The method of the rhino census as introduced and

described by Schenkel and Schenkel-Hulliger (1969) is based on a count of tracks along transects across the peninsula. These transects do not always follow a fixed compass bearing because this is considered to be too time-consuming in some types of terrain. However, to facilitate orientation the routes usually follow topographical features, such as streams and mountain ridges (Ammann, 1985). In the case of the central area at issue, this means that the Cikarang river is followed all across the northern part of the dissected plateau. However, from the banks of the Cikarang river one cannot get a good impression of the region as a whole. It is a specific character of this river that its banks and the vicinity around them are covered by an almost pure stand of Schizostachyum zollingeri bamboo. As a source of forage of the Javan rhino, we considered such a vegetation as rather worthless (see Table 11f). Ammann (1985) is of the same opinion. Since a census is never undertaken in a period of continuous drought (see above) one may assume that the rhinos are in no way dependent on the main stream to satisfy their various needs for fresh water. Thus, it is far from unlikely that they tended to avoid the bamboo forests along the Cikarang river at the time of the census. This is an interesting hypothesis, since it implies the attractive possibility that the number of rhinos in Ujung Kulon is even higher than Ammann's correction of the census-results suggests. Further research on this point is of great importance.

11.4 Regions with important vegetation changes

11.4.1 Introductory remarks

Vast areas in Ujung Kulon are covered with secundary vegetation. As mentioned before, this is due to:

- destruction caused by the tidal wave, following the 1883 eruption of the Krakatau volcano;
- former inhabitance and cultivation, for the greater part ending in 1883;
- former vegetation management, at first on behalf of hunting, later on to increase the availability of food-plants for banteng. This management implied the maintenance of extensive artificial savannas by cutting and burning.

Recovery from these disturbances started one century ago, and again much more recently. Here we are mainly interested in knowing which processes are of importance at present and which changes occurred over the last decades, since information on these processes and changes is needed for the planning of an optimal terrain management.

Clues can be found in the comparison of recent and old (1946) aerial photographs and in field observations. However, neither approach provides very detailed information. The two series of aerial photographs are very different in quality as well as photograph characteristics such as tone and texture. This implies that not all the differences in these characteristics can be interpreted as differences in vegetation. Moreover, the necessary data of a ground survey of areas which have evidently changed strongly, e.g. the northern part of the coastal plain are missing, so we cannot understand in detail the vegetation pattern shown on the 1946 pictures. As for the field observations, these are more or less incidental of character, since the main

objective of our research was to study the actual pattern of vegetations, not their dynamics. It should be stressed that a detailed study of vegetation dynamics requires a different approach (see e.g. Hallé et al., 1978). The compilation of a vegetation or landscape-ecological map such as we have produced, can be considered as a most useful, if not indispensable expedient, but is only one part of such a study. We shall return to this subject in the following chapter (12).

In the next paragraphs, four regions will be discussed in which present or recent vegetation changes are (or were) most prominent. In each case, the impact of the vegetation changes on the food availability of the Javan rhino will be discussed briefly. These regions are:

- the northern part of the coastal plain of the mainland;
- the rattan shrublands of the interior;
- the beach ridge;
- the present grazing grounds.

11.4.2 The northern part of the Coastal plain (landscape unit 21).

Here, since 1946, the last vast areas of (alang-alang) savanna have disappeared. At present, these areas are covered by specific, very homogeneous forest types generally dominated by Ardisia humilis (comm. XXII, XXIII and XXXVII; see also section 9.4). Further succession is believed to lead very slowly towards a more diverse forest type. This would be a more mature form of the Ximenia-Ardisia community (XXIII; compare plot 38) on the raised pseudo-barrier reef, a Nauclea-Syzygium forest (XXI) in most parts of the lagoon and possibly a form of the Derris-Sonneratia forest (XXXVIII) in the lowest, more or less permanently brackish parts of the lagoon. However, there are no indications that such changes will take place within the next few decades to come.

The change of savanna to forest in this area undoubtedly reduced the availability of food plants to the rhino. As mentioned above, the area is not used intensively by rhinos at present. Formerly, the situation was very different. According to Hoogerwerf (1970), the coastal plain was once one of the major feeding areas of the rhino (apparently in spite of its seasonal water shortage). In fact, Hoogerwerf mentions as the major food plants two species which are (as far as non-littoral vegetations are concerned) more or less restricted to the coastal plain, viz. Glochidion zeylanicum and Desmodium umbellatum. Possibly, these species grew more abundantly in the savannas than they do now in the Ardisia shrub forests. Moreover, as Ammann (1985) points out foodplants are more attractive to the rhinos when they grow in unshaded vegetation. In fact, this principle also applies to the dominant species of the stub forests (Ardisia humilis). Although this species may be considered as a (slightly) important foodplant species (see Table 10c), and their trunks in the stub forests are not yet too thick for the rhinos to break, we never observed feeding marks on Aridisia in the stub forests. The only case of feeding on Ardisia in the coastal plain was observed in a remnant of the former Imperata dominated savannas near Niur (Calotropis-Dodonaea community).

Succession towards more diverse forest types can be assumed to imply a certain increase in the suitability of the district as a feeding area.

11.4.3 The rattan shrublands of the interior (mainly landscape units 12, 13, 14 and 19)

In many parts, the pattern of former fields in the interior can still be more or less clearly be recognized: instead of being covered by forest again, the former humas (dry rice fields) and reumas (i.e. recently deserted humas) have, for the greater part, turned into extensive and impenetrable rattan-shrublands, 'glades' as Schenkel et al. (1978) call them (Hyptis-Daemonorops comm., no. XV). Obviously, the total area covered by these vegetations is far more extensive than realized by Schenkel et al..

Succession towards more woodlike vegetations is strikingly slow. We do not agree with Schenkel's assumption that rapid changes occur in these vegetations. (Note that Schenkel did not have any imagery at his disposal, neither out-dated nor recent and that an inventory of the area's plant communities was not one of his objectives). Vegetation changes do, however, occur and though the exact mechanism is not yet fully understood, they are likely to lead in the long run, according to soil-characteristics to forest types related to either the Bambusa-Drypetes community (XII) or the Pterospermum-Arenga community (VII). As for the number of hectares involved, the latter process is the most important one. However, it is interesting to note that in our experience wherever in Ujung Kulon rattan shrublands showed signs of succession towards a more forest-like vegetation, Arenge obtusifolia (as a species) was never observed to be a pioneer of any significance. Moreover, the species is virtually lacking in the more mature secondary forests in the western-most part of the Salacca plain, where (in contrast to most parts of this landscape unit) the clay soils are sufficiently well-drained to allow the occurrence of Arenga (see plot 302).

Vegetation changes within the rattan shrub jungles are of very great importance as far as food availability to the rhinos is concerned, since these vegetations cover an enormous surface in Ujung Kulon and have proved an excellent feeding area. Unfortunately, our knowledge on the (slow) changes in the vegetation is limited. Even so, it is possible to indicate some main lines. We may assume that the succession in the rattan shrublands (which all belong to the Hyptis-Daemonorops community) proceeds along the following steps:

a. Succession from sub type with Lantana camara to sub type with Dillenia excelsa. Gradually, the Lantana shrubs disappear, while the density of sapling-sized treelets (belonging to various species) strongly increases.
b. Appearance of taller trees and small groups of trees emerging above the closed shrub layer.
c. Gradual closing of the tree layer. Simultaneously, there is a gradual decline of the shrub layer, including small sized treelets and tall gingers.

ad a: As for food availability to the rhino, step a. is undoubtedly an important improvement, since the Dillenia sub type, with regard to both species composition and structure, is an even more ideal feeding habitat than the Lantana sub type. Ammann (1985) is of the same opinion. Although he does not discern floristically defined sub types of shrublands, he does mention once Lantana dominated forms as being a non-optimal feeding area.

ad b: We assume this step to be a slight improvement, although the total

area of the valuable shrublands is somewhat reduced. The parts of the shrubland where trees occur are less intensively used by the rhinos (Ammann, 1985), but the landscape as a whole, viz. a mosaic of open shrubland, shrubland with scattered trees and small groups of trees is considered to be the optimal feeding area by the same author. This is undoubtedly due to the abundance of transitional vegetations rich in food plants.

ad c: This step is a very complex one, since more than one forest type can be expected to develop, depending on differences in soil (see above). We assume that the dominance of Arenga obtusifolia in secondary vegetations on relatively well-drained soils originates, when successional stage c coincides with an exceedingly dry year. The impact of which is probably reinforced by vertic properties of the (sub)soil and eventual forest fires. Under such circumstances young Arenga trees, sprouting from subterraneous shoots, are less vulnerable to (climatic) hardship than 'normal' treelets. (On the less well drained soils, the same story holds for the young offshoot of Bambusa blumeana).

The hypothesis presented above implies that the genesis of Arenga-dominated vegetations depends on a number of uncertain factors (of varying importance):

- the coincidence of an exceedingly dry year and successional stage c.
- the availability of some scattered, mature Arenga trees from which subterraneous shoots can sprout (vicinity).
- possibly the occurrence of forest fires.

In addition, we may point to a most important uncertainly for the distant future: the impact of the ash cover on the vertic character of the subsoil. Vertic processes imply the mixing of material from the surface and topsoil with lower horizons. In the specific case of Ujung Kulon, this implies that the subsoils will gradually become somewhat more coarse in texture. This will in turn reduce the vertic character of the subsoil. There are indications that even small differences in the (original) texture of the subsoil are even at present of great importance for the succession. For instance, soil types o and p are in many respects rather similar and both carry the same type of Arenga forest (VIIa). However, type p is (slightly) sandy and the predominance of Arenga (consequently?) less pronounced. More such examples could be given. Further study must however prove this assumed relation. As for the availability of rhino food plants, the various types of secondary forest, resulting from step c, vary largely. Moreover, they may vary with regard to the average size and density of gaps. With their abundance of rapid-growing tree seedlings and saplings, gaps are of enormous importance as a source of rhino-food (Hommel, 1983; Ammann, pers.comm.; Ammann, 1985). However, gaps are very scarce in young secondary forests. Even in the one hundred year old stands of the Bischofia-Ficus community (X) and the Nauclea-Syzygium community (XXI) in Ujung Kulong gaps, are rare; at least they were until recently. Thus, we may conclude that step c implies primarily a decline of food availability. Only in the long run can a renewed increase in food plants be expected, when the frequency of gap forming increases. When strangling figs start to invade the forest, the average gap-size will increase notably. Moreover,

in the very distant future the dominance of Arenga palms may be assumed to decline gradually, as shade-tolerant species will settle. The closed canopy of the Arenga forest allows such settling, since the forest micro climate is readily buffered against seasonal drought. However, availability of seeds (vicinity) is the major constraint.

Although quantitative data are lacking, we assume that at present, in most stands of the rattan shrublands, step b (i.e. appearence of taller trees and small groups of trees) prevails. This implies that currently in these landscape units food availability is slightly increasing and we assume that this situation will not alter much during the next few decades. However, more detailed, quantitative research is urgently required.

11.4.4 The beach ridge (landscape unit 16)

The two series of aerial photographs both show in many parts of the beach ridge a rather complex pattern of different vegetations. However, it proves that nearly all these vegetations can, at least at present, be considered as different forms of one and the same community (Comm. of Dendrocnide and Syzygium; XIX). Probably, the situation formerly was, on average, not very different, although at times the share of the grassland communities (no. XXV and XXXII p.p.) must have been much greater.

The internal variation of the stands of the Dendrocnide-Syzygium community can primarily be explained as the result of irregular, former cutting and burning practices, although other aspects are also of importance (see section 9.3.XIX).

It is very likely that illegal 'vegetation management' by poachers persisted in this remote zone, which is reknowned for its abundant wildlife, for far longer than in the northern coastal plain. On the other hand, vegetation management as a tool of nature conservation has always been of minor importance in this region.

By comparising of the two series of photographs, we learn that east of the mouth of Citadahan, succession has lead to relatively closed vegetations, more than is the case in the western area between Cibunar and Citadahan. This phenomenon can easily be explained. In the eastern part natural processes prevailed, while the western part was again submitted to vegetation management only recently (in the seventies). The actual area in which management practices were executed also actually covered a small part of the adjacent fluvio-alluvial plain, situated between the beach ridge and the Cibunar river.

As for the impact of these vegetation changes on food availability to the rhinos, there are many similarities with the situation as described for the rattan shrublands. However, it seems that on the beach ridge succession proceeds less slowly, which can be explained by the lack of Krakatau ash in most parts (see section 9.4). Thus a decrease in rhino food is to be expected on the beach ridge much sooner than in the rattan shrublands of the interior. Considering the small total surface of this landscape unit, this is not a very dramatic development. Even so, it seems (for more than one reason) worthwhile to set back the succession now and then in parts of the area (see chapter 12).

11.4.5 The present 'grazing grounds' (landscape unit 23)

As stated before, it is not correct just to consider the few small grazing areas situated opposite Peucang Island and the Handeuleum archipelago, as representative relics of the extensive savannas which once occured along Ujung Kulon's north coast.

Their vegetation cover (mainly the community of Fimbristylis and Chrysopogon; XXVI) and their soil profiles differ significantly from the average situation in the former savanna landscape (see section 9.3.XXVI). Even so, the forest type which constantly tries to occupy these artificial clearings is a very common one, viz. the community of Nauclea and Syzygium (no. XXI), which also covers extensive parts of the interior of the coastal plains.

In fact, to allow the grazing grounds to survive, annual management is preferable and currently in general, also executed. During the years of our fieldwork, the park managing authority, PPA, put a lot of effort into the rehabilitation of one of these sites, viz. the grazing ground situated between the mouths of the Cikuya and Cidaon rivers. At present, the boundaries of all three Chrysopogon grazing grounds correspond fairly well (again) with the situation as shown on the 1946 imagery.

However, there is one striking difference. In 1946 there was a third grazing area opposite Peucang Island, viz. west of the mouth of the Cikuya river (plot 99). At present, this site is completely covered with Nauclea-Syzygium forest. The soil profile of this site is less characteristic (i.e. more loamy) than the ones below the remaining grazing areas. Possibly, less unfavourable soil conditions stimulated a more vigirous growth of invading forest pioneer species, which in turn explains the fact that the site was given up as a grazing ground.

As far as availability of rhino foodplants is concerned, this obviously implied an improvement. However, considering the very small size of the locality this improvement is rather insignificant.

As far as the remaining grazing grounds are concerned, the continuous alternation of management and sprouting of regrowth is hardly of interest for the rhinos. Young treelets are removed before they reach the size preferred by the rhino.

CHAPTER 12: ASPECTS OF MANAGEMENT

12.1 Introduction

This chapter presents some conclusions with regard to the management of Ujung Kulon. We shall restrict ourselves to aspects concerning the food availability of both rhino and banteng, the possible reintroduction of the tiger and gibbon and the botanical value of the area. The conclusions for the greater part correspond with the ones formulated by Hommel (1983). Only some minor corrections and additions have been made. Finally, some recommendations for management and future research will be summarized.

12.2 Food availability of the Javan rhinoceros

Active vegetation management in order to increase the food availability of rhino food plants has been described by Schenkel et al. (1978). This management implies the local cutting of Arenga obtusifolia (langkap) palms in vegetations dominated by this species. In 1982, Schenkel & Schenkel-Hulliger proposed starting such management activities.

The background of this proposal is formed by a number of assumptions:

- Arenga forest is of little importance for the Javan rhino, as far as food availability is concerned;
- rapid vegetation changes are occurring in Ujung Kulon especially in the rattan shrublands, which contain important food sources for the Javan rhino (such as giant gingers, treelets and saplings), but are at present threatened by the rapidly invading Arenga;
- a change in feeding behaviour of the rhino indicates a shortage of food plants.

In spite of our great respect for Prof. Schenkel's longstanding experience in Ujung Kulon and his enormous merits concerning the conservation of the Javan rhino, we tend to believe that these assumptions are not all quite correct and at present there is no real need for an active vegetation management on behalf of the Javan rhino.

As for the significance of Arenga obtusifolia forest as a food source for the rhino, we do agree that the food availability in the Arenga forest itself is indeed very limited. However, large gaps in the palm layer are regularly caused by the downfall of forest giants, such as strangling figs and temporarily provide a wealth of saplings, i.e. rhino food. These natural gaps are in fact very similar to the 'management plots' described by Schenkel et al. Furthermore, the marginal zones and (as Schenkel himself also indicates) the forest edges are important sources of food plants.

As for the presumed rapid changings in the rattan shrublands it proves that succession in these vegetations is on the contrary remarkably slow. Moreover, we assume that succession in these shrublands (and also in Ujung Kulon as a whole) over the last decades have not lead to a decrease in the food availability but, on the contrary, to a slight increase. There is also no need to fear a decrease in immediate future.

As for the suggested change in feeding behaviour, this hypothesis is contradicted by the conclusions of the WWF-rhino research team (Sajudin, pers. comm.). Moreover, the different results of the various students of rhino food

plants can at least for the greater part, be explained by different research methods and different study areas.

Finally, it is of importance to observe that there are indications that in the long run Schenkel's management approach may yield the opposite of its purpose. After a few years, the Arenga palms seem to return (sprouting from subterraneous shoots) in higher densities than before, as observed in Schenkel's experimental plots (Hilligers, pers. comm.) Unfortunately, the exact location of these plots is not well indicated. After the return of the Arenga forest, the sites no longer strongly contrast with the surrounding vegetation and at present they cannot be traced.

12.3 Food availability of the banteng

With the alang-alang savannas, obviously important feeding areas for the banteng have disappeared. However, no decrease in numbers of this species has occurred. Apparently, the banteng is far less dependent on open grasslands than Hoogerwerf (e.g. 1970) realized.

The rattan shrublands of the interior can also be considered as being an important source of foodplants for the banteng. Though a decrease in the total area of these shrub lands may eventually lead to a certain decrease in the number of bantengs in Ujung Kulong, we may assume that the species is ecologically flexible enough. No dramatic collapse of the population is expected, not even in the distant future.

At present, there is absolutely no need for restoration of the former alang-alang savannas as far as the food-availability for banteng is concerned.

12.4 Reintroduction of the tiger and gibbon

The Javan tiger disappeared from Ujung Kulon over fifteen years ago. At present, the Javan tiger (a distinct subspecies) has probably died out in all parts of its former distribution area. There are no specimens left in zoos either. Reintroduction of tigers in Ujung Kulon would thus imply the import of an alien subspecies, e.g. the Sumatran tiger. If the savanna-landscape in the northern part of the coastal plain were to be restored, this might be feasible. It would certainly contribute to the completeness of Ujung Kulon's ecosystem and its value as a National Park. However, we strongly advise against such an experiment. There are no guarantees that the animals can be kept within the park's boundaries, which means that there are no guaranties they will survive. Moreover, it will negatively influence the villagers' attitude towards the vicinity of a conservation area. Finally, the presence of tigers can be considered as a threat for the Javan rhino, in a direct way as a (possible) predator on rhino-calves, but (more important) in an indirect way; since fear of tigers cannot be expected to stimulate the park staff to patrol very intensively, especially in the interior. Although the last tiger died years ago in West Java, the fear of this large predator is still very much alive.

As for a possible reintroduction of the Javan gibbon there are no such objections. We may assume that gibbons occured in Ujung Kulon before the Krakatau eruption, but did not survive the complete defoliation of the forest. At present, large areas of ideal gibbon habitat are (again) available, especially on Mt.Payung and the central plateaus. It is assumed that the

gibbons from nearby Mt.Honje cannot reach the central and most western parts of Ujung Kulon, because of discontinuities of forest cover. The animals avoid the ground and its proximity. This means that after the reintroduction of gibbons, uninterrupted forest stands may become of great importance, regardless of their width. Thus, the narrow strips of Areca-Arenga forest in the fluvio-alluvial plain and (even more important) the Dendrocnide-Arenga forest on the land side of the calcareous beach ridge may become of great significance as gibbon corridors. This provides an additional reason to refrain from any vegetation management (sensu Schenkel) in these stands.

12.5 Botanical value

Ujung Kulon is one of the last remaining wilderness areas in the lowlands of Java. It contains extensive stands of primary and old secondary vegetations in which many rare species are present. The special climatical and plant-geographical position of the area further contributes to its botanical significance. From a botanical point of view, the upper parts of Mt.Payung (primary, evergreen rainforest) and both Peucang Island and the upper parts of Mt. Telanca (primary and old secondary semi-deciduous forest) are the most valuable parts. However, the botanical significance of the Arenga forests of the lower altitudes on the mainland is often underestimated. Here we find many relics of the former primary, semi-deciduous forests (though in very low densities), some of them lacking on Peucang Island and possibly also on Mt. Telanca (e.g. Palaquium ottolanderi). From a botanical point of view, area management (sensu Schenkel) in Arenga forests is not very attractive. The younger secondary vegetations including those which are still, or until recently, influenced by management practices are less interesting. This also holds for the rattan shrublands of the interior, in spite of the remarkably high species-diversity of many of them. One exception to this rule is the man-made grasslands on the calcareous beach ridge along the south coast, in which an extremely rare grass (Digitaria heterantha) can be found. Continuation of the management (cutting and burning) there (i.e. near Cibunar) is thus desirable. Compared to the rainforest of Mt.Payung, the primary forests of Mt.Honje are of even greater botanical value. In spite of their status as conservation area they are still very much endangered. Rapid action here is urgently required.

12.6 Recommendations

- The conservation of the Javan rhino should remain the very first objective the management of the Ujung Kulon National Park. As Schenkel stressed many times, this greatly depends on the attitude and physical welfare of the guards. This means that they should always receive sufficient payment, appreciation for their work and medical care (see also Schenkel, 1982).
- Reintroduction of tigers is strongly advised against; reintroduction of Javan gibbon should be seriously considered.
- Strict protection should be given to the last remnants of primary forest on Mt.Payung, Mt. Telanca, Mt.Honje and Peucang Island.
- Area-management (sensu Schenkel) in the Arenga forests of the interior is

not at present required and is advised against.

- Area-management in the northern parts of the coastal plain is not needed for the food availability of either rhino or banteng.
  However, some sort of vegetation management in areas which were formerly covered by alang-alang savannas may be considered desirable, e.g. to increase the visibility of the animals on behalf of visitors. In that case we recommend a system of 'shifting management', i.e. regularly clearing one relatively small part of the total area, which consequently should be neglected for at least five years. The resulting diversity in both vegetation and scenery may be considered as an improvement of an area which is at present little more than an ecological ruin.
  In a considerable part of the former savannas, however, succession should be allowed to proceed without human intervention.
- A similar type of management is proposed for the (western part of) the calcareous beach ridge and the environs of the present grazing grounds, but should not extending beyond the boundaries of the Nauclea-Syzygium forest.
- The following research items are considered to be urgent:
  a. the succession from rattan shrubland to forest;
  b. the influence of both rhino and banteng on succession;
  c. food-competition of these two species in relation to succession;
  d. possibilities for translocation of rhinos to other areas as soon as the population size allows it;
  e. the impact of the high densities of herbivores on the regeneration of the forest on Peucang Island.

SUMMARY

I. Introduction

the study area

Ujung Kulon is a peninsula situated on the utmost western tip of the island of Java (Indonesia). The area covers some 30 000 ha. Its fame and importance are mainly due to its population of Javan rhinoceros, which is probably the last remaining one in the world.

background of the study

Scientific research in Ujung Kulon has focussed until now mainly on the rhinoceros and some other big mammals. A systematic study of the area's vegetation cover has never been undertaken. Other aspects of the landscape (e.g. soils) were also poorly understood. This holds even for something as basic as topography.

objectives of the study

The first and major objective of our study was to fill in some of these gaps in the knowledge, especially concerning the area's major vegetation types and their distribution. A second objective was to give a broad estimate of the suitability as a rhino-habitat for the various sub-regions. Moreover, information would be gathered on possible vegetation changes, which might affect the availability of rhino-foodplants.

methods

As for methods, we have opted for a broad landscape-ecological approach. Thus, the landscape was studied as a fully integrated entity, in which vegetation is but one of the ingredients (or 'attributes'). In this report the major attributes (history, climate, geology, geomorphology, soils, flora, vegetation and fauna) are first described in separate chapters. The next step is an integration of all information, resulting in the description of landscape-units. These are shown on the landscape-ecological map, which is attached to this report as an appendix. The landscape-units (or parts of them) can be interpreted in terms of suitability for rhino. Moreover, they provide a basis to describe and judge the major lines of succession. Finally, conclusions can be given in terms of recommendations for management and future research.

II. Aspects of the landscape ('land-attributes')

history

Once, the area was inhabited and partly under cultivation. Depopulation followed as the aftermath of the 1883 eruption of the Krakatau, a volcano situated only 60 km from Ujung Kulon. Tidal waves (tsunamis) swept away the coastal villages and volcanic ash covered the fields in the interior. The pattern of the former fields can still be recognized, at least on the less well drained soils. Once deserted, the area became a hunting-area and later (in 1921) a nature reserve. In the northern part of the coastal plain vast savannas were maintained by regular cutting and burning of regrowth. During the last decades, this form of vegetation management has largely been neglected.

climate

The climatological position of Ujung Kulon is of special interest. Rainfall data for Java's First Point (representative of Ujung Kulon's lowlands) show a yearly average of 3 249 mm and some 30 to 40 rainy days during the four consecutive driest months of the year. This implies that, in theory, the area

is a borderline case as far as the possibility of the growth of evergreen rainforest is concerned. However, in practice, the regular occurrence of an exceedingly dry season prevents the growth of rainforest. Thus the climax vegetation of the area's lowlands is a (semi)deciduous monsoon forest. On the other hand, evergreen rainforest does occur on the higher parts of Ujung Kulon's mountain area (Mt. Payung). The ecologically important contrast between lowlands and mountains of only moderate height (500 m) is caused by the so-called telescope-effect: relatively low, isolated mountains, surrounded by sea, reflect the physiognomic vegetation-zoning of higher mountains in a condensed, 'telescoped' way. Moreover, on Mt. Payung rainforest species occur at far lower altitudes than usual on the mainland of Java.

geology and geomorphology

Geologically, Ujung Kulon is a very young area. Its oldest parts (Mt. Payung) date back to the Miocene. An outline of the various geomorphological units (with notes on their geology) is given in section 6.3. The units can be grouped as follows:

- the SW hilly region (including the Mt. Payung massif). This is the highest and most steeply dissected part of the area.
  The major types of rock are tuffs and eruptive rock (probably andesite).
- the central calcareous region, consisting of both limestone plateau fragments and rolling to hilly uplands with heterogeneous marine sediments as parent material.
- the plains, consisting of both a fluvio-alluvial plain (separating the two main units mentioned above) and several types of coastal plains (s.l.) varying significantly in their origin and lithology.

Soils

An outline of the various soil types of Ujung Kulon is given in section 7.3. The soils are classified according to the FAO-UNESCO system (1974) and grouped and arranged according to drainage features. An important aspect of the soils (not included in the classification) is the topsoil of Krakatau ash. The thickness of the ash topsoil (0 to 30 cm) is determined by a complex of factors, e.g. drainage of the subsoil, slope (percentage and length) and altitude. On low altitudes along the north coast, the ash-layer is generally lacking, which is mainly due to the erosional impact of the 1883 tidal waves.

Flora and plant-geography

The plant-geographical position of Ujung Kulon is very interesting. The lowlands can be considered as a drought island in predominantly ever-wet West Java, showing some similarity in flora with the seasonally dry eastern part of the island. The rainforests of the 'mountains' have some genera in common with the rainforests of nearby Sumatra, which are lacking elsewhere on Java. Moreover, many species occur in Ujung Kulon which are rare elsewhere in Java or are believed to be extinct there. One species even is not known to occur anywhere outside of Ujung Kulon (Heritiera percoriacea, Sterculiaceae).

Vegetation

An outline of the various vegetation types of Ujung Kulon is given in section 7.3. The types are described as plant-communities; they are defined on a basis of their complete floristic composition, unbiased by any existing classification system. A gross vegetation table, showing all vegetation types and all sociological species groups is attached to this report as an appendix.

A shortened version is given in Table 9a. The plant-communities, on account of their floristic composition, can also be clustered into a smaller number of community groups. These groups, like the communities themselves, can readily be interpreted in an ecological way. Moreover, they are rather homogeneous as far as their physiognomy is concerned. However, they do not fully correspond with the various formations which are found in the area. Therefore, the most characteristic formations are discussed in a special section (9.4). These formations are:

- palm forests: secondary forests, more or less restricted to relatively well drained soils; on lower altitudes; probably to a large extent influenced by the incidental occurrence of an exceedingly dry year. Both forest fires in the past and vertic properties of the soil are assumed to be of additional importance.
- bamboo forests: secondary forests, replacing the palm forests on less well drained soils or (more locally) replacing the rattan shrublands (see below; mainly on locations strongly influenced by erosion processes).
- stub forests: secondary forests of the coastal plains, which originated from the artificial savannas after the gradual neglect of their maintenance.
- rattan shrublands: secondary shrub vegetations of the lowlands, restricted to only moderately well or somewhat poorly drained soils; remnants of the former fields, where the contrast in physical properties between the subsoil and the ash-topsoil, in combination with the exposed location and the seasonally dry climate, hampered normal succession towards forest.

fauna

The fauna was not dealt with in great detail, mainly because many others have studied Ujung Kulon's abundant wildlife. Attention was paid to only a few (groups of) mammals, viz. the Javan rhinoceros, the primates, the larger carnivores and the even-toed hoofed mammals. The latter group comprises all larger herbivores of the area, other than the rhino, thus all its potential food competitors. As for the Javan rhinoceros, the major habitat requirements are discussed, viz. accessibility, absence of pathogenic germs and availability of salt, water (to drink and bath), mud (to wallow) and cover (protection against climatic hardship and to provide hiding places).

III. Integration and evaluation

the landscape-units

An outline of the various landscape-units is given in section 11.2 (see also the attached landscape-ecological map). For each of the landscape-units, the cover of the various vegetation types and soil types was estimated (see resp. Tables 11a and 11c).

suitability as rhino-habitat

Of all habitat requirements described, three are assumed to show important regional differences. These requirements are: availability of forage, availability of drinking water and accessibility. The suitability of the environment in relation to each of these requirements is shown on three draft-maps (Fig. 11a-c), using the landscape-ecological map as a basis. The three aspects are integrated into one 'suitability-map' (Fig. 10d) using a very simple, semi-quantitative model. Due to the lack of detailed information and the rough character of the procedure, the resulting map is only of indicative value. Even so, it is interesting to compare this map with the distribution

map of the rhino, as given by Schenkel and Schenkel-Hulliger (1969). We assume that the size of the distribution area and the total number of rhinos have been systematically underestimated by former students, due to imperfection of the census method.

important changes in the vegetation

Vast areas in Ujung Kulon are covered with secondary vegetations of very different age. Large areas thus carry a vegetation cover which is still far remote from its climax state. An outline of areas in which at present (or only recently) important changes in the vegetation cover are taking (or have taken) place, is given in section 11.4. As for the suitability for rhino, the change of the rattan shrublands in the interior towards forest is the most important. Eventually, this will lead to a decrease in the availability of forage. However, the succession is strikingly slow, while intermediate stages are assumed to provide more forage than the initial ones. At present and for the next few decades, no decrease of available forage is to be feared.

IV. Conclusions

aspects of management

The final chapter of this study (12) presents some conclusions with regard to the management of the area. Attention is paid to the food availability of the Javan rhino and the banteng (wild ox), possible reintroduction of tiger and gibbon and the botanical value of the area.

recommendations

A number of practical recommendations are enumerated in section 12.6. These are briefly:

- the conservation of the Javan rhinoceros should remain the very first objective of the management in Ujung Kulon. This depends for the greater part on the attitude and physical welfare of the guards;
- reintroduction of tigers is strongly advised against, reintroduction of gibbons (in the central part of the area) should be seriously considered;
- strict protection should be given to the last remnants of primary forest on Mt. Payung, Mt. Honje, Peucang Island and Mt. Telanca;
- area-management in the Arenga palm-forests of the interior is at present not needed and is not advised;
- area-management in the northern part of the coastal plain is not necessary as far as the food availability for rhino or banteng is concerned. However, some sort of vegetation management may locally be applied for other reasons;
- some vegetation management (periodically clearing of regrowth) is proposed for the utmost western part of the beach ridge along the south coast and the environs of the present grazing areas (in addition to the regular management of the grazing grounds themselves).

In addition, some recommendations for future research are given:

- the succession of the rattan shrublands towards forest;
- the influence of both rhino and banteng on succession;
- food-competition between these two species in relation to succession;
- possibilities for translocation of rhinos to other areas as soon as the population size allows;
- the impact of the high density of herbivores on the regeneration of the forest on Peucang Island.

RINGKASAN (Concise summary in Indonesian language)

Semenanjung Ujung Kulon yang terletak di titik paling barat pulau Jawa adalah salah satu dari dataran rendah rimbaraya yang terakhir di pulau itu. Sebagai daerah cagar-alam, Ujung Kulon penting sekali karena daerah itu kemungkinan merupakan satu-satunya tempat penhuni badak jawa di dunia.

Semenanjung yang sekarang tidak berpenghuni itu sebelumnya memang ditinggali dan sebagian besar terpakai sebagai tanah pertanian. Titik balik sejarah Ujung Kulon disebabkan oleh letusan terkenal dari gunung Krakatau yang terletak di dekatnya pada tahun 1883. Letusan ini diiringi air bah yang menyapu bersih desa-desa dan tumbuh-tumbuhan di selusur pantai. Karenanya juga seluruh semenanjung, termasuk tanah pertanian ditutupi oleh lapisan abu tebal dari gunung berapi itu.

Sekarang, satu abad sesudah bencana, tanam-tanaman yang tumbuh, memperlihatkan pola ragam dari berbagai jenis vegetasi terutama vegetasi sekunder. Dan ternyata keaneka-ragaman itu ditentukan oleh sejumlah faktor yang cukup besar. Pertama-tama hal itu dapat diamati dengan hubungan antara vegetasi dengan geomorfologi dan tanah. Selanjutnya hal itu sebagian besar dapat dijelaskan dengan perbedaan iklim, pengaruh dari binatang dan terutama penggunaan tanah sebelumnya.

Karena sifat-sifat tertentu yang sangat tidak menguntungkan dari abu lapisan atas tanah bagi semai muda, kita masih bisa mengenali dengan cukup jelas keadaan pola tanah dari tahun 1883. Daripada ditumbuhi lagi dengan hutan, tanah itu sekarang hanya dipadati dengan semak belukar berduri. Namun begitu, semak itu sangat kaya akan makanan untuk badak-badak Jawa.

Jenis vegetasi di daerah pantai mencerminkan bentuk pemakaian tanah yang berbeda jauh dengan pemakaian sebelumnya. Di sana, padang rumput buatan dipertahankan dengan cara 'pengelolaan vegetasi', yaitu dengan penebangan dan pembakaran.

Perubahan-perubahan vegetasi dari Ujung Kulon dalam 30-40 tahun terakhir kemungkinan tetap terbatas pada justru daerah-daerah di mana dulu dibakar dan ditebang dan pada bekas tanah-tanah pertanian.

Perubahan-perubahan di daerah-daerah tebang-bakar berlangsung lancar dan menghasilkan jenis hutan yang sangat homogen dan khas. Sekarang jenis hutan ini secara pelahan-lahan akan terus berkembang menjadi hutan yang kaya jenisnya. Sedangkan perkembangan selanjutnya dari semak-belukar yang menutupi bekas tanah-tanah pertanian merupakan proses yang jauh lebih muskil dan juga belum jelas sama-sekali. Jadi perubahan-perubahan yang terjadi di sini sangat lambat sekali.

Hingga kini, keseluruhan perubahan dalam vegetasi pasti tidak jelek bagi badak-badak Jawa. Karena akhirnyapun perkembangan selanjutnya dari tumbuh-tumbuhan di bekas tanah-tanah pertanian mungkin memang akan berarti kemunduran dari tersedianya bahan makanan.

Namun jumlah wilayah semak-belukar yang begitu penting bagi badak-badak Jawa sebenarnya masih sangat banyak. Perubahan perubahannya seperti yang telah disebut di atas, sangat lambat dan ada kemungkinan bahwa bahan makanan untuk badak Jawa yang terdapat dalam antar-periode/fase, akan lebih kaya lagi daripada semak-belukar yang sudah ada sekarang.

Oleh karena itu, untuk sementara waktu, tentunya tidak ada alasan untuk berpindah ke sistim 'pengelolaan vegetasi aktif'.

REFERENCES

AMMANN, H., 1985. Contributions to the ecology and sociology of the Javan rhinoceros (Rhinoceros sondaicus Desm.). Diss. Basle. 229 pp.

ANONYMOUS, 1854. Verslagen van de Natuurkundige Vereniging over bezoeken aan Bantam; in: Natuurkundig Tijdschr. Ned. Indie VI, p. 15.

ANONYMOUS, 1969. Bibliografi mengenai perlindungan alam di Udjung Kulon (Bibliography on nature reservation on the peninsula Udjung Kulon). Seri bibliografi no. 16. Bibliotheca Bogoriensis; Bogor. 10 pp.

ANONYMOUS, 1974. Bibliografi A. Hoogerwerf (Bibliography of A. Hoogerwerf). Seri bibliografi no. 27. Bibliotheca Bogoriensis; Bogor. 46 pp.

AQUASI BOACHI, 1855. Onderzoek naar kolen gevonden langs het strand van de Meeuwenbaai. Natuurkundig Tijdschrift van Ned. Indie, IX, p.49-52.

ARMY MAP SERVICE U.S.ARMY, 1943. Topographical maps. Sheet number: 31,31 XXXVIII C and D; 32, 33 XXXIX A, B, C and D. Washington D.C.

AVERY, T.E., 1978. Forester's Guide to aerial photo interpretation. U.S. Department of Agriculture, Forest Service. Agriculture Handbook 308, 41 pp.

BACKER, C.A., 1913. Een lastige vreemdeling. De Tropische Natuur 2, p.27-31.

BACKER, C.A., 1917. Indische duinplanten. De Tropische Natuur 6, p. 89-92.

BACKER, C.A., 1928. Handboek voor de Flora van Java; part 2. Gramineae, p. 1-291.

BACKER, C.A. and R.C. BAKHUIZEN van den BRINK Jr., 1963-1968. Flora of Java. 3 Vols. Noordhoff, Wolters, Groningen.

BACKER, C.A. and O. POSTHUMUS, 1939. Varenflora voor Java. Buitenzorg.

BEMMELEN, R.W. van, 1949. The Geology of Indonesia. 2 Vols. Nijhoff; the Hague

BEMMELEN, W. van, 1916. Verzameling van verhandelingen omtrent hetgeen bekend is aangaande den grond van Nederlandsch Indie en zijn gebruik ten tijde van het Bodemcongres te Djocjakarta, no. 2.

BERGER, L.G. den, 1927. Unterscheidungsmerkmale von recenten und fossilen Dipterocarpaceengattungen. Bull. Jard. Bot. Buitenz. III (8), p. 495-498.

BIE, H.C.H. de, 1901-1902. De landbouw der inlandsche bevolking op Java. 2 Vols.

BLOWER, J.H. and A.P.M. van der ZON, 1977. Proposed Ujung Kulon National Park, Management plan 1977-1981. Fieldreport of UNDP/FAO. Nature Conservation and Wildlife Management Project INS273/013, Bogor. 90 p.

BOEREMA, J., 1931. Gemiddeld aantal regendagen op Java en Madoera in de vier opvolgende, voor iedere plaats droogste maanden van het jaar. Verh. Kon. Magn. Meteor. Observ. Batavia, no. 23.

BOOBERG, G., 1929. Een plantensociologisch onderzoek van de duinen bij Poeger. Hand. 5de Ned. Ind. Natuurw. Congres (1928).

BOOBERG, G., 1931. De grondvormen, etages en phytocoenosen van Java's vegetatie. Hand. 6de Ned. Ind. Natuurw. Congres (1931).

BORSSUM WAALKES, J. van, 1951. Pulau Panaitan (Prinsen-eiland): Botanisch gedeelte; in: Hoogerwerf, 1951; p. 159-181.

BRAAK, C., 1945. On the climate of and meteorological research in the Netherlands Indies; in: Honig and Verdoorn: Science and Scientists in the Netherlands Indies, p.15-22.

BURGER, D., 1930. Brand in gebergtebosch. Tectona 23, p. 392-407.

BURNHAM, C.P., 1975. The forest environment: soils. In: Whitmore (1975), p. 103-120.

COOLHAAS, W.Ph. (ed.), 1960-1979. Generale missiven van Goeverneurs-generaal en raden aan heren XVII de Verenigde Oostindische Compagnie. 7 Vols., covering the period 1610-1725. Nijhoff; 's Gravenhage.

DAM, P. van, 1701. Beschrijvinghe van de Oost-Indische Compagnie. Re-published by: F. Stapel (1927-1943), 6 Vols. and C.W.Th. van Boetzelaer van Asperen en Dubbeldam (1954), 1 Vol. Nijhoff; 's Gravenhage.

DAMES, T.W.G., 1955. The Soil of East Central Java; with a soil map 1 : 250,000. Contributions of the General Agricultural Research Station, no. 141. Bogor. 154 pp.

DESAUNETTES, J.R., 1977. Catalogue of landforms for Indonesia. AGL/TF/INS/44, Working paper no. 13. Soil Research Institute, Bogor. 111 pp.

DETMER, W., 1907. Botanische und landwirtschaftliche Studien auf Java. Jena.

DJAJA, B., H.R. SAJUDIN and L.Y. KHIAN, 1982. Studi vegetasi untuk keperluan makanan bagi badak Jawa. Special report no. 1. IUCN/WWF

Project no. 1960. Facultas Biologi, Universitas Nasional, Jakarta. 90 pp.

DRANSFIELD, J., 1971. Report of field trip to Ujung Kulon, 11-22 April 1971. Biotrop, Bogor. 4 pp.

EITEN, G., 1968. Vegetation forms. A classification of stands of vegetation based on structure, growth form of the components, and vegetation periodicity. Boletim do Instituto de Botanica, no. 4. Sao Paulo, Brasil. 67 pp.

ELLENBERG H. and D. MUELLER-DOMBOIS, 1967. Tentative physiognomic-ecological classification of plantformations on the earth. Ber. geobot. Forsch. Inst. Rubel 37, p.21-55.

ENDERT, F.H., 1935. Shorea javanica, een belangrijke harsleverende producent in het Natuurmonument Soebah. Tectona 28, p. 488-491.

ENDERT, F.H, 1936. Verslag Ned. Ind. Ver. Natuurbescherming over 1935, p. 117-124.

ENDERT, F.H., 1952. Verslag van een in 1931 naar Udjung Kulon gemaakte dienst-tournee. In: Hoogerwerf, 1952; p. 182-187.

ES, L.J.C. van, 1916. Geologische overzichtskaart van den Nederlandsch - Indischen Archipel 1 : 1,000,000. Toelichting bij blad XV. Jaarboek van het Mijnwezen in Ned. Indie, Verh. II.

EWUSIE, J.Y., 1980. Elements of Tropical Ecology. Heinemann, London. 205 pp.

FABER, D.A., 1952a. Terreinverslag van een bodemkundige tournee in het natuurreservaat Udjung Kulon van 26 februari tot 18 maart 1952. In: Hoogerwerf (1952), p.120-133.

FABER, D.A., 1952b. Preliminary soil map of Udjung Kulon, scale 1;100,000 (unpublished).

FAO, 1976. A framework for land evaluation. Soils Bulletin no. 32. FAO; Rome. 72 pp.

FAO, 1977. Guidelines for soil profile description. FAO; Rome. 61 pp.

FAO-UNESCO, 1974. Soil map of the world (1:5,000,000). Vol.I: legend. Unesco; Paris. 59 pp.

FRANCIS, P., 1976. Volcanoes. Penguin books; Harmondsworth.

GEISE, N.J.C., 1952. Badujs en Moslims in Lebak parahiang, Zuid Banten. Diss. Leiden. 266 pp.

GILS, H. van and I.S. ZONNEVELD, 1982. Vegetation and rangeland survey. Lecture note N-7; Rural survey course, ITC; Enschede. 49 pp.

HAILE, N.S., 1971. Quaternary shorelines in West Malaysia and adjacent parts of the Sunda Shelf.Quaternaria 15, p. 333-343.

HALDER, U., 1975. Oekologie und Verhalten des Banteng (Bos javanicus) in Java: eine Feldstudie. Mammalia depicta series. Parey; Hamburg and Berlin. 124 pp.

HALLE, F., R.A.A. OLDEMAN and P.B. TOMLINSON, 1978. Tropical trees and forests; an architectural analysis. Springer; Berlin (etc.). 411 pp.

HEYNE, K., 1950. De nuttige planten van Indonesie. 3rd ed. 2 Vols. Hoeve; 's Gravenhage - Bandung.

HILDEBRAND, F.H., 1954. Aantekeningen over Javaanse Bambu-soorten (Notes on Javanese bamboo species). Report of the Forest Research Institute, no. 66. Bogor. 52 pp.

HOEK, M. and A. KOSTERMANS, 1950. Verslag over een bezoek aan het Wildreservaat Udjung Kulon. Dienstrapport. Bogor.

HOMMEL, P.W.F.M., 1982. Mapping vegetation in inhospitable terrain. WWF monthly report, April 1982, p. 103-105. Gland.

HOMMEL, P.W.F.M., 1983. Ujung Kulon Vegetation Survey (WWF/IUCN project 1963); preliminary results, including a landscape-ecological map (scale 1 : 75,000). WWF report, Gland. 84 pp.

HOMMEL, P.W.F.M., in prep. Some notes on the applicibility of the plant-community concept in the tropics (preliminary title).

HOMMEL, P.W.F.M. and H. van REULER, 1986. The impact of the 1883 Krakatau eruption on the soils and vegetation of the Ujung Kulon peninsula, West Java, Indonesia; in: Proceedings of the 1883-1983 Krakatau Symposium (1983), p. 453-455. Jakarta.

HOOGERWERF, A., 1937. Rapport over een dienstreis door het wildreservaat Oedjoeng Koelon (Zuidwest Banten-West Java). Dienstrapport no. 2, 's Lands Plantentuin, afd. Natuurbescherming; Buitenzorg (Bogor). 115 pp.

HOOGERWERF, A., 1938. Oedjoeng Koelon in de Westmoesson (tournee 29 April - 10 Mei 1938). Dienstrapport no. 6, 's Lands Plantentuin, afd. Natuurbescherming; Buitenzorg (Bogor). 80 pp.

HOOGERWERF, A., 1951. Verslag over de expeditie naar het Natuurpark Pulau Panaitan (Prinseneiland) in de Straat Sunda van 30 Augustus - 5 October 1951. Djawatan Penjelidikan Alam (Kebun Raya Indonesia); Bogor. 194 pp.

HOOGERWERF, A., 1952. Verslag over in 1951 en 1952 naar het Natuurpark Udjung Kulon gemaakte diensttournee's. Dienstrapport no. 32. Djawatan Penjelidikan Alam (Kebun Raya Indonesia); Bogor. 160 pp. (+ appendices).

HOOGERWERF, A., 1970. Udjung Kulon, the land of the last Javan rhinoceros. Brill; Leiden. 512 p.

HOOGERWERF, A., 1972. Verslag over een bezoek aan het Meru Betiri complex, het Blambang-Purwo of Zuid Banjuwangi wildreservaat, het Ijang hoogland en het Udjung Kulon wildreservaat, Java, Indonesië, in de maanden Augustus t/m November 1971. Nederlandsche Commissie voor Internationale Natuurbescherming.

HUMBOLDT, A. von, 1806. Ideen zu einer Physiognomik der Gewachse. Cotta; Stuttgart. 28 pp.

IVERSEN, J., 1936. Biologische Planzentypen als Hilfsmittel in der Vegetationsforschung. Diss. Kobenhavn. Meddelelser fra Skalling-laboratiet 4. Kobenhavn.

JACOBS, J. and J.J. MEIJER, 1891. De Badoej's. Kon. Inst. voor Taal-, Land-en Volkenkunde van Nederlandsch-Indie. Nijhoff; 's Gravenhage.

JACOBS, M., 1981. Het tropisch regenwoud, een eerste kennismaking. Coutinho, Muiderberg. 318 pp.

JUNGHUHN, F.W., 1850-1854. Java, zijne gedaante, zijn plantentooi en inwendige bouw. 4 Vols.

JUNGHUHN, F.W., 1867. Licht en schaduwbeelden uit de binnenlanden van Java. 5th revised ed. Amsterdam.

KAL, H.Th., 1910. Het schiereiland Djoengkoelon. Tijdschrift voor het Binnenlandsch Bestuur 38, p.136.

KAPPELER, M., 1981. The Javan Silvery Gibbon (Hylobates lar moloch). Ecology and Behaviour. Zoological Institute of Basel University. 121 pp.

KARTAWINATA, K., 1965. Notes on the vegetation of Peutjang Island (Southwest Java). Symposium on Ecological Research in Humid Tropic Vegetation, Kuching (1963), p. 26-28. Unesco; Paris.

KARTAWINATA, K. and A. APANDI, 1977. Checklist of plant species on the Peucang Island (Ujung Kulon Nature Reserve, West Java). Berita Biologi 2 (1), p. 13-18.

KARTAWINATA, K., A. APANDI and T.B. SUSELO, 1986. The forest of Peucang Island, Ujung Kulon National Park, West Java. In: Proceedings of the 1883-1983 Krakatau Symposium (1983), Jakarta. 9 pp.

KOOLS, J.F., 1935. Hoema's, hoemablokken en boschreserves in de residentie Bantam. Diss., Wageningen. Veenman; Wageningen. 187 pp.

KÖPPEN, W., 1918. Klassifikation der Klimate nach Temperatur, Niederschlag und Jahreslauf. Petermanns Mitt. 64, 193.

KÖPPEN, W., 1936. Das geographische System der Klimate. In: Handbuch der Klimatologie (ed. W. Koppen und W. Geiger). Vol. 1, Teil C. Berlin.

KORTZ, A., 1952. Verslag van het tournee van 3 t/m 12 juli naar het wild-reservaat Udjung Kulon. Bogor. 30 pp.

KOSTERMANS, A.J.G.H., 1959. A monograph of the genus Heritiera Aiton (Sterc.). Reinwardtia IV (4), p.465-583.

KÜCHLER, A.W., 1967. Vegetation mapping. Ronald Press Company; New York. 472 pp.

LEENHOUTS, P.W., 1983. Notes on the extra-Australian species of Dodonaea (Sapindaceae). Blumea 28, p.271-289.

LUSLI, S., 1982. Habitat badak Jawa (Rhinoceros sondaicus Desm. 1822) di Ujung Kulon. Skripsi, Facultas Biologi, Universitas Nasional, Jakarata. 65 pp.

MEEUWEN, M.S. van, H.P. NOOTEBOOM and C.G.G.J. van STEENIS, 1961. Preliminary revisions of some genera of Malaysian Papilionaceae. Reinwardtia 5, p. 419-456.

MEIJER, J.J., 1891. Tjarita ki Asdoera. Bijdr. T.L. en V.kunde N.I. V(6) (part 40 of the complete series). p. 347.

MEIJER DREES, E., 1954. The minimum area in tropical rain forest with special reference to some types in Bangka (Indonesia). Vegetatio (Acta Geobotanica) V-VI, p.517-523.

MOHR, E.C.J., 1933. De bodem der tropen in het algemeen en die van Ned. Indie in het bijzonder. Meded. Kon. Ver. Kol. Inst. Afd. Handelsmuseum 31, I (1).

MOHR, E.C.J., 1944. The soils of equatorial regions with special reference to the Netherlands East Indies. Translated by R.L. Pendleton. Ann. Arbor., Michigan. 765 p.

MOHR, E.C.J., F.A. van BAREN and J. van SCHUYLENBORG, 1972. Tropical soils; a comprehensive study of their genesis. 3rd ed. Mouton, Ichtiar Baru, van Hoeve; the Hague, etc. 481 p.

MOLLIER, J.N., 1863. De houtsoorten van Prinseneiland. Tijdschr. voor Nijverheid en Landbouw in Nederlandsch Indie (9) NS 4, p. 257-271.

MULTATULI, 1860. Max Havelaar of de koffieveilingen der Nederlandse Handel-Maatschappij. Donker, Rotterdam. 272 p.

MUELLER-DOMBOIS D. and H. ELLENBERG, 1974. Aims and methods of Vegetation Ecology. Wiley and Sons; New York. 547 pp.

OLDEMAN, L.R., 1975. An Agro-climatic map of Java. Contr. Centr. Res.

Inst. Agric. Bogor, no. 17. 22 pp.

PANNEKOEK, A.J., 1949. Outline of the geomorphology of Java. Tijdschr. van het Ned. Aardr. Gen., LXVI, p. 270-326.

PAUWELS, W., in prep. Sus scrofa vittatus, its ecology and behaviour in Ujung Kulon National Park, Java, Indonesia. Diss. Basle.

PELLEK, R., 1977. A study of plant species and soils in different vegetation zones in an Indonesian moist forest. Diss., Hawaii. 156 pp.

PELLEK, R., 1986. Selected chemical, physical, and morphological properties of Krakatau tuff versus recently mineralized horizons. Soil Science 141 (1), p. 52-59.

PETRIDES, G.A., 1975. Principal foods versus preferred foods and their relation to stocking rate and range condition. Biol. Conserv. 78, p. 161-169.

PIETERS, D., 1954. Iets over de dieren van Pulau Panaitan en uit aangrenzende streken (herten en hun belagers). Penggemar Alam 34, p.25.

PPA, 1979. Laporan Inventaris Flora dan Monitoring Ekosistim di Suaka Alam Ujung Kulon. Bogor. 27 pp.

PPA, 1982 . Team Task Force Penyelamatan Badak. Kematian badak Jawa di Taman Nasional Ujung Kulon Tahun 1981/1982. Bogor. 42 pp. + 3 App.

PPT, 1981. Terms of reference tipe - A, Pemetaan tanah. Departemen Pertanian, Badan Penelitian dan Pengembangan Pertanian. Proyek Penelitian Pertanian Menunjang Transmigrasi (P3MT). Pusat Penelitian Tanah; Bogor.

PRATER S.H., 1965. The book of Indian mammals. Bombay Nat. Hist. Society and Prince of Wales Museum of Western India; Bombay.

RAUNKIAER, C., 1937. Plant life forms. Clarendon; Oxford. 104 pp.

REULER, H. van, 1982. Comparison of the Indonesian Soil Classification System with the USDA Soil Taxonomy and the FAO/UNESCO legend of the soil map of the world. UNESCO-MAB programme; Bogor. 8 pp.

REULER, H. van, 1986. Ujung Kulon peninsula, West Java, Indonesia. In: Breimer, R.F., A.J. van Kekem and H. van Reuler. Guidelines for soil survey and landevaluation in ecological research. MAB Technical Notes 17. UNESCO; Paris. 125 pp.

SAJUDIN H.R., B. DJAJA and S. LUSLI, 1984. Javan rhino census - April 1984. IUCN/WWF project 1960. 19 pp.

SATMOKO, K.P.R., 1961. Ujung Kulon Nature Park, Java. Malayan Nat. Journ. Special issue, p. 107-124.

SCHENKEL, R. and L. SCHENKEL-HULLIGER, 1969. The Javan Rhinoceros (Rh. sondaicus Desm.) in Udjung Kulon Nature Reserve. Its Ecology and Behaviour. Field Study 1967 and 1968. Acta Tropica XXVI (2), p. 97-135.

SCHENKEL, R., 1971. Mission Nashorn. Hallwag Verlag; Bern and Stuttgart. (Dutch edition: Operatie Neushoorn, undated. La Riviere and Voorhoeve; Zwolle. 213 pp.)

SCHENKEL, R., L. SCHENKEL-HULLIGER and W.S. RAMONO, 1978. Area management for the Javan rhinoceros (Rhinoceros sondaicus Desm.). A pilot study. The Malayan Nature Journal XXXI (4), p. 253-275.

SCHENKEL, R. and L. SCHENKEL, 1982. Situation of the Javan rhino in Ujung Kulon National Park. Assessment in March 1982 after the sudden death of five rhinos. In: PPA, 1982 (appendix). 17 pp.

SCHIMPER, A.F.W., 1898. Pflanzengeographie auf physiologischer Grundlage. Fischer; Jena.

SCHMIDT, F.H. and J.H.A. FERGUSON, 1951. Rainfall types based on wet and dry period ratios for Indonesia with western New Guinea. Verh. Djawatan Met. dan Geofysik, Djakarta 42. 77 pp.

SIMKIN, T. and R.S. FISKE, 1983. Krakatau 1883, the volcanic eruption and its effects. Smithonian Institution Press, Washington DC.

SOERIANEGARA, I., 1969. Soils of Peucang Island, Southwest Java. Geoderma 2, p.297-308.

SOERIANEGARA, I., 1970. Soil investigation in Mount Hondje Forest Reserve, West Java. Rimba Indonesia 25, p.1-16. Rimba Indonesia 25, p.1-16.

SOIL CONSERVATION SERVICE, 1981. Soil Survey Manual. Chapter 4. Preprint. USDA; Washington.

SOIL SURVEY STAFF, 1975. Soil Taxonomy. A basic system of soil classification for making and interpreting of soil surveys. Soil Conservation Service. U.S. Department of Agriculture. Agriculture Handbook, No. 436. Washington. 754 pp.

SOMBROEK, W.G. and R.F. VAN DE WEG, 1980. Some considerations on quality and readibility of soil maps and their legends. In: annual report 1980, p. 4-17. International Soil Museum; Wageningen.

STEENIS, C.G.G.J. van, 1934. On the origin of the Malaysian Mountain Flora, part 1. Bull. Jard. Bot. Buit. III (13), p. 135-262.

STEENIS, C.G.G.J. van, 1935a. On the origin of the Malaysian Mountain Flora, part 2. Bull. Jard. Bot. Buit., III (13), p. 289-348.

STEENIS, C.G.G.J. van, 1935b. Maleische Vegetatieschetsen. Tijdschr.

Kon. Ned. Aardr. Gen. 52, p. 25-67, 17-203 and 363-398 (reprint with index and figures added).

STEENIS, C.G.G.J. van, 1939. Klimplantsluiers en plantendekens als typen van inzakkende vegetatie. De Tropische Natuur 28 (9), p. 141-149.

STEENIS, C.G.G.J. van, 1950. The delimitation of Malaysia and its main plant geographical divisions. Fl. Mal. I (1), p. lxx-lxxv.

STEENIS, C.G.G.J. van, 1957. Outline of vegetation types in Indonesia and some adjacent regions. In: Proceedings of the 8th Pacific Science Congress. Vol. IV, p.61-97.

STEENIS, C.G.G.J. van, 1958. Basic principles of rain forest sociology. In: Proceedings of the Symposium on the Study of Tropical Vegetation. Kandy, Ceylon (1956), p. 159-165.

STEENIS, C.G.G.J. van, 1961a. An attempt towards an explanation of the effect of mountain mass elevation. Proc. Kon. Ned. Akad. Wet., Series C, 64, p.435-442.

STEENIS, C.G.G.J. van, 1961b. Axiomas and criteria of vegetatiology with special reference to the tropics. Tropical Ecology, 11, p. 33-47.

STEENIS, C.G.G.J. van, 1962. The mountain flora of the Malaysian tropics. Endeavour, XXI (83-84), p. 183-193.

STEENIS, C.G.G.J. van, 1965, (assisted by Mrs. A.F. Schippers-Lammertse). Concise plant-geography of Java. In: Backer and Bakhuizen van den Brink, 1965. 72 pp.

STEENIS, C.G.G.J. van, 1972. The mountain flora of Java. Brill, Leiden. 90 pp.

STEHN, C.E., 1929. Krakatau, part 1: the geology and volcanism of the Krakatau group. Fourth Pacific Science Congress.

STORER, T.I. and R.L. USINGER, 1965. General zoölogy. McGraw-Hill; New York, etc. 741 pp.

STRAHLER, A.N., 1969. Physical Geography. 3rd ed. Wiley and Sons; New York (etc.). 733 pp.

TRICHT, B. van, 1928. Levende Antiquiteiten in West-Java. G. Kolff and Co.; Batavia and Soerabaja.

VERBEEK, R.D.M., 1884-1885. Krakatau. 2 Vols. Batavia.

VERBEEK, R.D.M. and R. FENNEMA, 1896. Geologie van Java en Madoera. 2 Vols.

VERSCHUREN, J., 1967. Third report on the Udjung Kulon Research

project and Fourth preliminary report. WWF.

VERSTAPPEN, H.Th., 1956a. Landscape development of the Udjung Kulon Game Reserve. Penggemar Alam 36 (1-2), p. 37-51.

VERSTAPPEN, H.Th., 1956b. The physiographic basis of pioneer settlement in Southern Sumatra. Kementerian Pertahanan. Djawatan Topografi Angkatan Darat Balai Geografi, Djakarta. Publikasi no. 6. 25 pp.

VETH, P.J. 1903. Java, geografisch, etnologisch, historisch. 2nd ed., Vol.3.

VOGEL, P., 1979. Zur Biologie des Bindenwarans (Varanus salvator) im westjavanischen Naturschutzgebiet Ujung Kulon. Diss., Basle.

WATTS, I.E.M., 1955. Equatorial weather, with special reference to Southeast Asia. University of London Press; London. 224 pp.

WEXLER, H., 1951. Spread of the Krakatau volcanic dust cloud as related to the high level circulation. Bul. Am. Meteorol. Soc. 32, p. 48-51.

WHITMORE, T.C., 1975. Tropical rain forests of the Far East. Clarendon Press, Oxford. 282 pp.

WHITTACKER, R.H., 1973. Ordination and classification of communities. Handbook of vegetation science V. Junk; the Hague. 737 pp.

WHITTEN, A.J.W., 1980. Arenga fruits as a food for gibbons. Principes 24 (4), p. 143-146.

WIELEMAKER, W.G., 1984. Soil formation by termites: a study in the Kisii area, Kenya. Diss. Wageningen. Publication Department of Soil Science and Geology, Agr. Univ., no. 851. Wageningen. 132 pp.

WIRAWAN, N., 1965. Beberapa catatan mengenai keadaan vegetasi Gunung Payung (Ujung Kulon), Seminar Biologi I, Bogor. 11 pp.

WIJNGAARDEN, W. van, 1983. Inventory and evaluation of the natural resources of the Baoule region (Mali). ITC report (draft); Enschede. 69 pp.

YANCEY, T.E., 1973. Holocene radiocarbon dates on the 3 meter wave out noch in north western peninsular Malaysia. Geol. Soc. Malaysia Newsletter 45, p. 8-11.

ZONNEVELD, I.S., 1960. De Brabantse Biesbosch, een studie van bodem en vegetatie van een zoetwatergetijdendelta. (A study of soil and vegetation of a freshwater tidal delta). 3 Vols. Bodemkundige Studies no.4. Stichting voor Bodemkartering; Wageningen.

ZONNEVELD, I.S., 1979. Landevaluation and land(scape) science. ITC

textbook of photo-interpretation, VII (4). ITC; Enschede. 134 pp.

ZONNEVELD, I.S., 1982. Lectures in vegetation science. Syllabus; ITC and Agr. Univ.; Wageningen. 127 pp.

ZONNEVELD, I.S., 1985. Principles of landevaluation for extensive grazing. In: W. Siderius (ed.). Proceedings of the workshop on landevaluation for extensive grazing (LEEG). ILRI publication 36, p. 84-117. Wageningen.

ZONNEVELD, I.S., in prep. In: A.W. Küchler and I.S. Zonneveld: Vegetation mapping. To be published in Handbook of vegetation science series. Junk; Dordrecht.

APPENDIX A: SUMMARIZED PLOT-DATA

Column 1: Plot number
Column 2: Location, see Landscape-ecology map (Appendix F); * = in Mt.Nonje region
Column 3: altitude (m)
Column 4: slope (%); * = almost perpendicular
Column 5: vegetation type, see section 9.3;
* = insufficiently known; more or less intermediate between type XIV and XXI
Column 6: soil type, see section 7.3; * = water.
Column 7: depth of ash (cm); * = buried ash-layer, starting below 7 to 60 (mean 30) cm and 5 to 50+ (mean 22) cm thick.

1	2	3	4	5	6	7		1	2	3	4	5	6	7
1	N10	1½	0	XXVI	q	0		35	O4	3	0	VIIb	q	20
2	N10	2	0	XXI	q	0		36	n3	1	1	XXXII	b	0
3	N10	1½	0	XXI	s	0		37	n3	1½	1	XXXII	b	0
4	N10	1½	0	XXVII	u	0		38	G20	1	0	XXIII	d	0
5	O13	5	0	VII?b	r	10		39	e20	½	0	XXXV	x	215
6	Q16	3	3	XX	f	30		40	e20	1	0	XXIX	d	0
7	Q16	5	15	XXXI	f	10		41	e20	1	0	XXIII	d	0
8	Q16	4	5	XXXII	e	0		42	k33	2	1	XVb	i	0
9	Q16	5	5	XXV	f	20		43	g31	1	0	XXIII	d	0
10	Q16	10	5	XIX	f	10		44	F29	1	0	XXIII	d	0
11	Q16	12	6	XIX	f	0		45	D27	1	0	XXIX	d	0
12	t7	1	5	XXXII	b	0		46	D27	1	0	XXIII	d	0
13	t7	8	*	XXXIII	a	0		47	D26	1	0	XXXVII	x	0
14	S7	2	15	XXVIII	c	0		48	D26	1	0	XXXVII	x	0
15	R6	3	3	XXVIII	c	10		49	D26	½	0	XXXV	x	0
16	N2	80	1	VII?a	o	30		50	D26	½	0	XXXV	x	0
17	j14	2	0	XXIX	c	0		51	D26	½	0	XXXV	x	0
18	K14	5	1	XIII	u	*		52	D26	½	0	XXXV	x	*
19	K14	5	1	XIII	u	*		53	d26	1	0	XXII	x	0
20	K15	10	0	XIII	l	20		54	d25	1	0	XXII	s	0
21	M7	1½	0	XXIX	c	0		55	d26	½	0	XXXV	x	0
22	M7	1	0	XXX	v	0		56	d26	0	0	XXXIV	*	0
23	M7	2	0	XI	e	?		57	E22	1	0	XXIX	d	0
24	K9	1½	0	XXIX	b	0		58	E22	1	0	XXIII	d	0
25	j14	2½	1	VIIc	l	25		59	e20	1	0	XXII	d	0
26	k15	12	2	VIIc	l	5		60	o20	½	0	XXXV	x	0
27	K9	3	0	X	e	0		61	q20	1	3	XXIX	c	0
28	K9	2	0	XI	e	0		62	J16	2	0	VIIc	l	10
29	Q16	5	2	XXXII	f	10		63	19	1	2	XXIX	c	0
30	Q16	5	2	XXXI	f	10		64	M8	1	0	XXIX	c	0
31	t7	2	1	XXXII	c	0		65	N10	1½	0	XXVI	q	0
32	q6	1	2	XXVIII	b	0		66	M8	1	0	XXIX	c	0
33	q6	6	0	VIIb	h	0		67	N10	1½	0	XXVI	q	0
34	o4	1½	0	XXIX	c	0		68	n11	4	1	XIV	r	*

1	2	3	4	5	6	7
69	n12	3	0	XIII	r	*
70	m11	3	0	XIII	r	20
71	N10	0	0	XXXVIII	w	0
72	N12	3	0	XIII	r	25
73	N12	3	0	XIII	r	25
74	N10	1½	0	XXVII	q	0
75	17	1	0	XXXVIII	w	0
76	m10	1	3	XXIX	c	0
77	n10	1	3	XXIX	c	0
78	m10	0	0	XXXVIII	w	0
79	N10	1½	0	XXVII	q	0
80	N11	2	0	XIII	r	20
81	n2	½	20	XXXII	b	0
82	n2	1	3	XXVIII	c	0
83	o2	15	30	VIIa	o	10
84	n2	70	2	VIIa	o	35
85	o2	60	20	VIIa	o	30
86	N2	70	15	XVb	o	25
87	N2	60	5	VIIa	o	30
88	N2	25	10	VIIb	i	5
89	m3	4	1	VIIc	r	10
90	m3	4	13	XXI	s	0
91	n3	1½	1	VIIa	g	25
92	N1	2	3	XXVIII	c	0
93	m1	2	1	XXVIII	c	0
94	n1	40	38	VIIb	i	25
95	N2	60	0	XXVII	u	45
96	N2	60	25	XVa	u	0
97	m2	75	0	VIIb	i	10
98	N9	1½	0	XXVI	q	10
99	N8	1½	0	XXI	q	55
100	N10	½	0	XXXVIII	w	0
101	P15	50	35	VIIb	i	25
102	q15	½	30	XXVIII	c	0
103	R15	50	60	XVIII	h	0
104	q15	50	75	XVIII	h	0
105	Q16	½	0	XVb	r	0
106	Q16	1½	6	XXVI	r	0
107	Q15	50	35	VIIb	j	25
108	Q16	4	1	XIII	r	15
109	g14	150	38	II	j	15
110	q14	250	55	II	j	20
111	R12	350	40	II	j	30
112	r11	450	40	II	j	4
113	r12	450	40	II	j	15
114	r12	350	30	II	h	16
115	S13	250	65	IV	h	25

1	2	3	4	5	6	7
116	S13	150	65	III	h	30
117	S10	500	55	I	j	12
118	s8	350	35	II	j	16
119	S10	475	50	I	j	15
120	S10	450	35	II	j	20
121	T7	150	25	III	j	15
122	t7	25	75	XXXI	a	0
123	T7	3½	5	XXVIII	e	0
124	T7	5	1	XIX	?f	10
125	T7	50	70	XVIII	h	0
126	s8	250	35	II	j	15
127	r10	475	55	I	j	20
128	R12	480	55	I	?h	20
129	n11	50	70	III	?h	20
130	n11	45	5	XVa	r	0
131	O11	75	25	III	h	10
132	o10	150	40	III	j	20
133	P10	250	40	II	j	5
134	P10	200	40	III	h	15
135	Q9	500	10	I	?h	15
136	Q9	450	38	II	j	20
137	q10	350	40	II	j	15
138	Q8	450	70	II	h	10
139	Q8	350	50	II	h	10
140	Q8	250	60	II	j	3
141	Q6	150	70	III	a	0
142	Q6	3	2	XX	?f	15
143	Q6	35	65	XVIII	h	0
144	m13	120	45	V	f	0
145	M12	120	1	V	l	20
146	Q16	6	0	XIX	f	13
147	p18	2	0	XVa	r	15
148	p18	2	0	XIV	r	15
149	p18	2	0	XXVII	u	0
150	P18	3	0	XIV	r	30
151	P18	3	0	XVa	r	18
152	P18	3	0	XIV	r	20
153	o18	3	0	XIV	r	25
154	o18	3	0	XIV	r	15
155	O18	7	0	XVa	r	25
156	O18	7	0	XVa	u	10
157	O18	8	1	XVa	u	0
158	n18	25	5	VIIc	f	0
159	p21	½	0	XXXII	u	*
160	p21	5	1	XVa	r	25
161	p21	25	30	XIX	f	0
162	P21	5	0	*	u	12

1	2	3	4	5	6	7
163	o22	18	5	XVa	t	12
164	P21	5	0	XVa	u	40
165	p21	5	1	XVa	r	15
166	p21	25	40	XIX	f	0
167	p26	25	3	XVa	t	20
168	p26	2	0	XIV	r	10
169	p26	8	5	XII	t	0
170	P27	8	4	XII	t	20
171	P27	8	0	XII	t	20
172	p27	8	1	XVa	t	0
173	p26	15	5	XVa	t	0
174	Q26	25	35	XX	f	0
175	Q26	25	13	XIX	f	5
176	Q26	3	50	XXXI	b	0
177	Q26	1	0	XXXII	b	0
178	Q16	5	40	XIX	f	0
179	I18	1	5	XXIX	c	0
180	i18	45	4	XVb	n	15
181	i18	45	1	VII?c	l	14
182	i18	70	0	XVa	n	25
183	j18	40	3	XVII	r	50
184	K18	45	2	XII	t	20
185	J18	70	1	VII?c	k	15
186	K19	70	1	VIIc	k	15
187	k18	45	6	XII	t	17
188	j18	75	1	VIIc	k	12
189	K19	50	2	VIIc	l	5
190	k19	45	1'	XII	t	10
191	k19	40	20	XVII	r	5
192	j20	50	2	XVb	n	10
193	j20	50	3	VIIc	k	20
194	j20	50	3	XVb	n	15
195	I18	5	2	VIIc	l	0
196	I18	20	13	VIIc	l	25
197	J15	2	0	XXIX	c	0
198	J15	3	1	XXI	s	*
199	J16	8	15	XII	t	0
200	n11	5	0	XIII	r	15
201	R43	2	0	VIIc	d	0
202	S41	7	40	XXXI	f	0
203	S41	15	5	XIX	f	0
204	r41	2	0	XVa	r	0
205	q41	0	0	XXXIX	y	0
206	q41	0	0	XXXIX	y	0
207	q41	½	0	XXXVIII	w	0
208	T45	2	0	XXIX	b	0
209	s45	4	0	XIX	f	0
210	s45	2	0	XXI	s	0

1	2	3	4	5	6	7
211	s45	1½	0	XXXVI	w	0
212	s45	5	0	VII?	p	0
213	S37	1	0	XXXV	x	*
214	S37	1	0	XXXV	x	*
215	r37	½	0	XXXVIII	w	0
216	r35	3	1	VIIc	f	10
217	R35	20	15	XII	t	0
218	p36	5	0	XXI	u	0
219	p38	10	0	XVa	n	20
220	p38	15	10	?VIIc	n	0
221	p37	15	2	VIIc	k	5
222	q35	1	0	XXXVI	x	*
223	q35	1	0	XXXV	x	0
224	R35	2	0	XVa	r	15
225	R35	4	3	VIIc	f	7
226	s37	5	0	VIIc	k	15
227	S37	2	0	XVa	n	?10
228	R42	1	0	XXXVIII	w	70
229	j31	0	1	XXX	w	0
230	J31	0	0	XXXIX	y	0
231	J31	0	0	XXX	w	0
232	J31	0	0	XXXIX	y	0
233	J30	½	0	XXXVIII	w	0
234	J30	½	0	XXXVIII	w	0
235	J30	2	1	XXI	q	19
236	J29	½	0	XXXVI	w	20
237	J28	5	2	XXI	s	25
238	J27	25	20	XVb	n	15
239	J27	30	15	VIIc	n	0
240	i25	40	0	VIIc	k	15
241	i26	20	0	XVII	r	40
242	k34	1	2	XXIX	c	0
243	k34	0	0	XXXVIII	w	0
244	L34	1	0	XXIII	d	0
245	L34	½	0	XXXV	x	*
246	k36	½	10	XXX	?w	0
247	k36	2	0	XXIII	d	0
248	k36	4	0	XXIII	d	0
249	k36	1½	0	XXIX	d	0
250	k36	2	0	XXIII	d	0
251	M35	0	0	XXXIX	y	0
252	m35	0	0	XXXIX	y	0
253	m35	½	0	XXXVIII	w	5
254	m35	1	0	XXXVI	w	0
255	N35	1½	0	XXI	s	10
256	133	1½	0	XXI	s	13
257	M32	18	0	VIIc	n	11
258	M32	5	5	XVb	r	45

1	2	3	4	5	6	7
259	N19	40	3	XVa	t	10
260	N19	40	10	XVII	t	0
261	N20	60	1	VIIc	k	0
262	M22	80	0	VIIc	k	0
263	N17	125	30	VII?c	m	0
264	M10	1	0	XXI	q	0
265	N18	70	15	VII?c	m	25
266	m22	70	10	XII	t	0
267	M22	100	2	VIIc	l	0
268	124	35	10	XVII	r	15
269	125	75	1	VIIc	r	18
270	M23	50	15	XII	t	8
271	124	75	2	XVII	n	15
272	124	75	4	XVb	n	15
273	124	75	1	VIIc	k	14
274	k24	70	2	XVII	r	18
275	L24	75	4	VIIc	k	9
276	N22	65	15	XII	t	0
277	M21	60	3	XVa	t	10
278	N22	65	7	XVa	t	4
279	N20	60	15	XVa	t	0
280	K8	1	0	XI	e	0
281	K8	1	0	X	e	?20
282	k8	20	1	VIII	k	12
283	L8	17	30	VIII	l	0
284	k8	20	0	VIII	l	22
285	L8	17	25	VIII	m	0
286	M8	2	2	XI	e	0
287	18	3	1	IX	m	?*
288	K6	20	1	VIII	k	20
289	L8	40	20	VIII	l	15
290	L16	75	2	XVa	t	15
291	L16	75	1	VIIc	m	25
292	115	100	1	VIIc	k	30
293	M14	150	0	V	m	20
294	k16	50	10	VIIc	m	25
295	k15	30	15	XVa	n	8
296	k16	40	1	XII	t	0
297	k14	10	3	VIIc	m	12
298	N7	12	10	VIIa	o	?4
299	n7	90	20	III	?h	?12
300	n7	30	15	VIIa	o	25
301	P16	5	0	XIV	r	22
302	P15	5	1	XIV	r	25
303	q13	300	40	II	j	18
304	q15	50	5	III	j	20
305	q15	45	45	III	j	12
306	n3	75	10	VIIa	o	23

1	2	3	4	5	6	7
307	n1	40	50	XVIII	i	15
308	m2	125	5	VIIb	i	24
309	m2	75	50	VIIb	i	0
310	18	2	0	X	e	25
311	K15	10	1	XVa	t	17
312	115	100	1	VII?	k	20
313	M14	125	3	VI	?k	*
314	k17	50	0	XII	t	19
315	e22	½	0	XXXV	x	0
316	e22	1	0	XXII	s	0
317	e22	1½	0	XXI	s	*
318	E26	1	0	XXII	s	0
319	e26	15	3	XII	n	28
320	e25	20	5	XII	n	20
321	D27	1	0	XXIII	d	0
322	c26	1	0	XXIX	c	0
323	c26	1	0	XXIV	d	0
324	L8	40	5	VIII	l	14
325	t50	15	0	VIIa	p	14
326	t48	5	1	VII?	p	22
327	t51	2	2	XIX	f	?20
328	n51	25	1	VII?	k	?20
329	Q39	0	0	XXXIX	y	0
330	o41	1	0	XXIII	d	0
331	k33	1½	0	XXVI	q	0
332	L33	2	0	XXI	s	0
333	L33	2	0	XXI	s	0
334	L33	2	0	XXI	q	?0
335	*	200	5	II	j	16
336	*	75	5	XVI	t	0

APPENDIX B: REFERENCE-PROFILES

(By H. van Reuler (see Chapter 7))

(for site-characteristics, see Appendix A)

Part 1: morphological descriptions

Plot 146 (Dystric cambisol developed on calcareous sandstone)

O	2-0	:
A	0-2	: Dark yellowish brown (10 YR 3/4); sandy clayloam; strong fine and medium granular; non sticky, non plastic, friable moist; many very fine, fine and common medium roots; slightly calcareous; clear smooth boundary.
Bw	2-8	: Dark yellowish brown (10 YR 3/4) and (10 YR 3/6); sandy clay loam; strong fine subangular blocky; slightly sticky, slightly plastic, friable moist; common very fine and fine pores; common very fine, fine and medium roots; abrupt broken boundary.
C	8-13	: Yellowish brown (10 YR 5/4); loam; weak fine subangular blocky; non sticky, non plastic, friable moist; few very fine and fine pores; few very fine, fine, and medium roots; abrupt irregular boundary.
2Bw	13-32/49	: Dark yellowish brown (10 YR 3/6); sandy clayloam; moderate fine subangular blocky; slightly sticky, slightly plastic very friable moist; common very fine, fine and few medium pores; common very fine, fine and medium roots; abrupt wavy boundary.
2C	32/49-60+	: White (10 YR 8/2) and dark yellowish brown (10 YR 4/6); sandy loam; single grain; non sticky, non plastic, loose moist; strongly calcareous.

Plot 284 (Eutric cambisol developed on limestone)

O	3-0	:
A	0-4	: Dark brown (10 YR 3/3) and black (N2/0); clay loam; moderate fine subangular blocky; slightly sticky, slightly plastic, friable moist; common very fine, fine and few medium pores; many very fine, fine, medium and few coarse roots; clear smooth boundary.
Bw	4-15	: Dark yellowish brown (10 YR 4/4); clay loam; strong fine subangular blocky; slightly sticky, slightly plastic, very friable moist; many very fine, fine and common medium pores; many very fine, fine, medium and few coarse roots; abrupt smooth bourdary.
C	15-22	: Yellowish brown (10 YR 5/4) mixed with dark yellowish brown (10 YR 4/4); loam; weak fine and medium subangular blocky; non sticky, non plastic, friable moist; common very fine, fine and medium pores; common very fine, fine, medium and few coarse roots; abrupt wavy boundary.
2A	22-36	: Brown to dark yellowish brown (10 YR 4/3.5); clay; strong medium subangular blocky; sticky, plastic, friable moist; many pores of all sizes; small pieces of charcoal; many very fine, fine, common medium and few coarse roots; clear wavy boundary.
2BA	36-49	: Dark yellowish brown (10 YR 4/5); clay; strong fine and medium subangular blocky; sticky, plastic, friable moist; many very fine, fine common medium and few pores; many very fine, fine, common medium and few coarse roots; clear wavy boundary.
2Bw1	49-73	: Yellowish brown (10 YR 5/4), yellowish red (5 YR 5/8); clay; strong moderate subangular blocky; common very fine and fine pores; few very fine and fine roots; gradual wavy boundary.
2BC	73-96/108	: Yellowish brown (10 YR 4/5) and (10 YR 5/4) and light yellowish brown to olive yellow (2,5 Y 6/5); (gravelly stony) clay; strong medium and coarse subangular blocky; sticky, plastic, friable moist; common very fine and fine pores; gravels and stones are strongly calcareous; very few fine and fine roots; abrupt wavy boundary.
R	96/108-120	: Strongly calcareous white coloured rock.

Note: In the subsoil weak slickensides-like features have been noticed.
Special attention has to be paid to the possible human influence on this profile.
Of this site a soil monolith has been collected.

Plot 292 (Dystric cambisol developed on limestone)

O	3-0	:
A	0-6	: Dark brown (10 YR 3/3) clay; strong fine and medium subangular blocky; slightly stricky, slightly plastic, friable when moist; many very fine, fine and few medium, coarse pores; many roots of all sizes; clear smooth boundary.
Bw	6-18	: Dark yellowish brown (10 YR 3/6) clay loam; moderate fine subangular blocky; slightly sticky, slightly plastic, friable when moist; common very fine, fine and few medium pores; many roots of all sizes; abrupt wavy boundary.
C	18-30	: Pale brown (10 YR 6/3) sandy loam; weak fine subangular blocky; non sticky, non plastic, very friable when moist; common very fine and fine pores; common roots of all sizes; abrupt wavy boundary.
2A	30-40	: Dark brown to dark yellowish brown (10 YR 3/4) clay; strong fine and medium subangular blocky; slightly sticky, slightly plastic, friable when moist; many

pores of all sizes; common very fine, fine and few medium, coarse roots; clear smooth boundary.

2Bw1 40-51 : Dark yellowish brown (10 YR 4/4) clay; moderate fine subangular blocky; sticky, plastic, friable when moist; common pores of all sizes; common very fine, fine and few medium, coarse roots; clear smooth boundary.

2Bw2 51-61 : Dark yellowish brown (10 YR 4/5) clay; strong fine subangular blocky; sticky, plastic, friable when moist; many very fine, fine common medium, coarse pores; common very fine, fine and few medium, coarse roots; clear smooth boundary.

2Bw3 61-74 : Dark yellowish brown (10 YR 4/6) clay; strong fine and medium subangular blocky; sticky, plastic, friable when moist; common pores of all sizes; common very fine, fine and few medium, coarse roots; clear smooth boundary.

2Bw4 74-103 : Dark yellowish brown (10 YR 4/6) with common fine distinct sharp black mottles; clay; strong fine subangular blocky; sticky, slightly plastic, friable when moist; common pores of all sizes; few very fine and fine roots; clear smooth boundary.

2Bw5 103-140+ : Dark yellowish brown (10 YR 4/6) with many fine distinct sharp black mottles ; clay; moderately fine subangular blocky; slightly sticky, slightly plastic, friable when moist; common very fine, fine and few medium, coarse roots; few very fine and fine roots.

Plot 301 (Gleyic cambisol developed in alluvial clayloam)

O 2-0 :

A 0-8 : Dark brown (10 YR 3/3) with common fine distinct clear gray (10 YR 5/1) mottles; silt loam, moderate very fine and fine subangular blocky, slightly sticky, slightly plastic, friable moist; common to few very fine and fine pores; many very fine, fine and common medium, coarse roots; abrupt smooth boundary.

Bw 8-13/17 : Brown (10 YR 4.5/3) with common fine distinct strong brown (7.5 YR 4/6 and 5/6) mottles; silt loam; weak very fine subangular blocky; slightly sticky, slightly plastic, very friable moist; many very fine, fine and common medium pores; common roots of all sizes; clear wavy boundary.

C 13/17-22 : Grayish brown (10 YR 5/2) with common fine and medium distinct strong brown (7.5 YR 5/6) mottles; (sandy) silt loam; slightly sticky, slightly plastic, very friable moist; common very fine, fine and medium pores; common roots of all sizes; clear broken boundary.

2BA 13/17-29 : Yellowish brown (10 YR 5/4) with few fine faint sharp strong brown (7.5 YR 5/6) mottles; sandy clayloam; weak fine subangular blocky; slightly sticky, weak fine subangular blocky; slightly sticky, slightly plastic, friable moist; common very fine, fine and few medium pores; common roots of all sizes; clear smooth boundary.

2Bw1 29-43 : Light brownish gray to grayish brown (10 YR 5.5/2) and yellowish brown (10 YR 5/4) with many fine and medium distinct sharp yellowish red (5 YR 5/8) mottles; slightly gravelly clayloam; weak fine subangular blocky; slightly sticky, slightly plastic, friable moist; common very fine, fine and few medium pores; common roots of all sizes; clear smooth boundary.

2Bw2 43-59 : Light brownish gray (10 YR 6/2) with many fine prominent sharp reddish yellow (5 YR 6/8) mottles; slightly gravelly clay(loam); weak fine and medium subangular blocky, sticky, plastic, friable moist; common very fine, fine and few medium pores; common very fine, fine and few medium, coarse roots; clear smooth boundary.

2Bw3 59-100+ : Heterogeneous colour, pale brown (10 YR 6/3), light gray (10 YR 7/2) and yellowish brown (10 YR 5/4) with many fine and medium prominent sharp strong brown (7.5 YR 5/8) mottles; gravelly sandy clay(loam); weak medium subangular blocky; slightly sticky, slightly plastic, friable moist; common very fine, fine and few medium pores; few very fine and fine roots.

Plot 303 (Dystric nitosol developed on sedimentary rock)

O 3-0 :

A 0-11 : Dark yellowish brown (10 YR 3/6) clay loam; moderate fine subangular blocky; slightly sticky, slightly plastic, friable moist; common to few very fine and fine pores; many roots of all sizes; abrupt wavy boundary.

C 11-18 : Brown (10 YR 5/3) loam; weak very fine subangular blocky; non sticky, non plastic, very friable when moist; common very fine, fine and few medium pores; common roots of all sizes; abrupt wavy boundary.

2Bw1 18-33 : Strong brown to yellowish brown (9 YR 5/8) clay; strong fine and medium subangular blocky; slightly sticky, slightly plastic, friable when moist; many pores of all sizes; many roots of all sizes; clear wavy boundary.

2Bw2 33-49 : Strong brown (7.5 YR 5/6) clay; strong medium subangular blocky; slightly sticky, slightly plastic, friable when moist; common pores of all sizes; many very fine, fine and common medium and coarse roots; clear smooth boundary.

2Bw3 49-83 : Strong brown (7.5 YR 5/7) clay; strong fine and medium subangular blocky; sticky, plastic, friable when moist; common to many very fine and fine pores, common coarse and medium pores; few very fine, fine and common medium coarse

roots; clear smooth boundary.

2Bw4 83-122 : Strong brown (7.5 YR 5/8) with few fine faint clear brownish yellow (10 YR 6/8) mottles; clay; strong medium subangular blocky, sticky, plastic, friable when moist; common pores of all sizes; few roots of all sizes; clear smooth boundary.

2Bw5 122-160 : Strong brown to yellowish red (7 YR 5/8) with few fine faint clear brownish yellow (10 YR 6/8) mottles; clay; strong medium subangular blocky; sticky, slightly plastic, friable when moist; common pores of all sizes.

Plot 304 (Dystric nitosol developed on sedimentary rock)

O 3/5-0 :

A 0-4 : Brown to dark yellowish brown (10 YR 4/3.5); with locally common fine distinct sharp strong brown (7.5 YR 5/8) mottles; sandy clayloam; weak fine subangular blocky; slightly sticky; slightly plastic, very friable moist; common very fine, fine and medium pores; many roots of all sizes; clear smooth boundary.

Bw 4-14 : Dark yellowish brown (10 YR 3.5/6); sandy clayloam; moderate very fine and fine subangular blocky; slightly sticky, slightly plastic, friable moist; few to common very fine and fine pores; many roots of all sizes; abrupt wavy boundary.

C 14-20 : Yellowish brown (10 YR 5/4), partly mixed with Bw material; loam; weak fine subangular blocky; non sticky, non plastic, very friable moist; common very fine and fine pores; common roots of all sizes; abrupt wavy boundary.

2BA 20-52 : (Dark) brown (7.5 YR 4/4) sandy; clayloam; strong fine subangular blocky; sticky, plastic, friable moist; common very fine, fine and few medium pores; many very fine, fine and common medium, coarse roots; clear smooth boundary.

2Bw1 52-87 : Strong brown (7.5 YR 4/6), clay; strong fine and medium subangular blocky; sticky, slightly plastic, friable moist; many very fine, fine medium and coarse pores; many very fine, fine and common medium, coarse roots; clear smooth boundary.

2Bw2 87-115 : Strong brown to yellowish red (7 YR 4/6); clay; strong fine and medium subangular blocky; sticky, slightly plastic, friable moist; common very fine, fine and medium pores; common very fine, fine, medium and few coarse roots; gradual smooth boundary.

2Bw3 115-150+ : Strong brown to yellowish (7 YR 4/6); clay; strong medium subangular blocky; sticky, slightly plastic, friable moist; many very fine, fine and common medium pores; common very fine, fine and few medium and coarse roots.

Note: In the 2Bw horizons vague indications for clay illuviation have been found. Regarding the pore volumes the clay illuviation should reach its maximum in the 2Bw2 horizon. In the 2Bw1 horizon the pore volume is high due to a termites nest.

Plot 306 (Eutric cambisol developed on andesite)

O 3-0 :

A 0-3 : Dark yellowish brown (10 YR 3/4); silty clayloam; moderate very fine subangular blocky; slightly sticky, slightly plastic, friable moist; common very fine, fine and few medium pores; many roots of all sizes; abrupt clear boundary.

Bw 3-15 : Dark yellowish brown (10 YR 4/4); silty clayloam moderate very fine and fine subangular blocky; sticky, plastic, friable moist; many very fine, fine and common medium pores; many roots of all sizes; clear wavy boundary.

C 15-23 : Light yellowish brown (10 YR 6/4); loam; weak fine subangular blocky; non sticky, non plastic, friable moist; common very fine and fine pores; common roots of all sizes; abrupt wavy boundary.

2A 23-25 : Dark yellowish brown (10 YR 3/6); silty clay; strong very fine and fine subangular blocky; sticky, plastic, friable moist; many very fine, fine and common medium pores; common roots of all sizes; clear wavy boundary.

2BA1 25-42 : Dark yellowish brown (10 YR 4/4); silty clay; strong fine subangular blocky; sticky; plastic, friable moist; many very fine, fine and common medium pores; strong fine subangular blocky; sticky, plastic, friable moist; many very fine, fine and common medium pores; common roots of all sizes; clear smooth boundary.

2BA2 42-53 : Dark brown to brown (7.5 YR 4/4); silty clay; strong fine and medium subangular blocky; sticky, plastic, friable moist; many very fine, fine and common medium pores; common roots of all sizes; clear smooth boundary.

2Bw1 53-68 : Strong brown (7.5 YR 4/6) with about 5% brown (7.5 YR 5/4) spots; clay; strong medium subangular blocky; sticky, plastic, friable moist; many very fine, fine and common medium pores; common very fine, fine and few medium, coarse roots; clear smooth boundary.

2Bw2 68-91 : Heterogeneous colour, reddish brown (5 YR 4/4) and about 20% brown (7 YR 5/4); clay; sticky, plastic, friable moist; few to common very fine, fine and few medium pores; common very fine, fine and few medium roots; clear smooth boundary.

2BC 91-130+ : Heterogeneous colour, brown (7.5 YR 5/4) and 15 to 40% reddish brown (5 YR 4/4); (slightly stony) clay; moderate fine and medium subangular blocky; sticky, plastic friable moist; few very fine and fine pores; few very fine and fine roots.

Plot 308 (Eutric cambisol developed on tuff)

O	3-0	:
A	0-4	: Dark brown (10 YR 3/3); loam; strong medium granular; slightly sticky; sligthly plastic, very friable moist; many roots of all sizes; clear smooth boundary.
Bw	4-17	: Dark yellowish brown (10 YR 4/4) with locally common fine distinct sharp strong brown (7.5 YR 5/8) mottles; loam; moderate very fine and fine subangular blocky; common very fine, fine and few medium pores; many roots of all sizes; abrupt wavy boundary.
C	17-24	: Yellowish brown (10 YR 5/3), mixed with Bw and 2BA material; slightly gravelly loam; weak fine subangular blocky; non sticky, non plastic, friable moist; common very fine, fine and few medium pores; few very fine, fine and medium root.
2BA	24-32	: Brown to dark brown (10 YR 4/3); loam; moderate fine subangular blocky sticky, slightly plastic, friable moist; many very fine, fine and common medium, coarse pores; common roots of all sizes; clear wavy boundary.
2Bw	32-59	: Brown to dark brown (10 YR 4/3); clay loam strong fine subangular blocky; sticky, plastic, friable moist; many very fine, fine, medium and coarse pores; common roots of all sizes; clear wavy boundary.
2BC	59-69	: Brown to dark brown (10 YR 4/3); (gravelly sandy) clayloam; strong fine and medium subangular blocky; sticky, plastic, friable moist; common very fine, fine and few medium pores; few very fine, fine and medium root abrupt wavy boundary.
2C	69-100+	: Weathered rock (tuff?) within cracks dark brown to brown (10 YR 4/3); sandy loam moderate fine subangular blocky; sticky, plastic, friable moist; common very fine, fine and few medium pores; very few very fine and fine roots.

Plot 310 (Calcaric regosol developed in coral sand)

O	3-0	:
A	0-14/23	: Black (N2/0) with white (10 YR 8/2) sandgrains; sandy loam; strong fine and medium granular; slightly sticky, slightly plastic, very friable moist; calcareous; many roots of all sizes; abrupt wavy boundary.
C	14/23-25	: Pale brown (10 YR 6/3); sandy loam; single grain; non sticky, non plastic, loose moist; calcareous; few roots of all sizes; abrupt wavy boundary.
2BA	25-35	: Dark yellowish brown (10 YR 3/4) and pale brown (10 YR 6/3) sandy, loam; weak very fine subangular blocky; slightly sticky, slightly plastic, very friable moist; common very fine and fine pores; strongly calcareous; many roots of all sizes; clear wavy boundary.
2Bw	35-43	: Yellowish brown (10 YR 5/4); sand; single grain; non sticky, non plastic, loose moist; strongly calcareous; common very fine, fine and few medium roots; clear wavy boundary.
2C	43-82	: Very pale brown (10 YR 8/4); (slightly) gravelly sand; single grain; non sticky, non plastic, loose moist; strongly calcareous; few very fine and fine roots; abrupt wavy boundary.
R	82-100+	: White (10 YR 8/2) with along the few roots C material, strongly calcareous.

Plot 311 (Gleyic luvisol developed in clayey material of unknown origin)

O	4-0	:
A	0-9	: Very dark grayish brown (10 YR 3/2) sandy clay; strong very fine and fine subangular blocky; sticky, plastic, friable when moist; many very fine fine and common medium pores; many roots of all sizes; abrupt wavy boundary.
C	9-17	: Yellowish brown (10 YR 5/5) sandy loam; weak fine subangular blocky; slightly sticky, slightly plastic, friable when moist; common very fine, fine and few medium pores; common very fine, fine and few medium roots; abrupt wavy boundary.
2BA	17-26	: Yellowish brown (10 YR 5/4) clay; moderate medium and coarse angular blocky; sticky, plastic, firm when moist; common very fine, fine and few medium, coarse pores; few very fine, fine and medium roots; clear smooth boundary.
2Bw1	26-52	: Yellowish brown (10 YR 5/4) to brownish yellow (10 YR 6/6) clay; moderable medium angular blocky; sticky, plastic, firm when moist; common very fine, fine and few medium pores; few very fine and fine roots; clear smooth boundary.
2Bw2	52-73	: Yellowish brown (10 YR 5/4) with commong faint fine clear strong brown (7.5 YR 5/8) mottles slightly gravelly (calcareous) clay; moderate medium angular blocky, sticky, plastic firm when moist; few very fine and fine pores, few very fine roots; abrupt wavy boundary.
2BC	73-100+	: Brown (10 YR 5/3) and white (10 YR 8/2) with common faint fine clear strong brown (7.5 YR 5/8) gravelly (calcareous) clay; weak medium angular blocky; sticky, plastic, firm when moist; common very fine and fine pores; very few very fine roots.

Plot 314 (Gleyic luvisol developed in clayey material of unknown origin)

O	2-0	:
A	0-9	: Gray (10 YR 5/1) with common fine distinct sharp strong brown (7.5 YR 5/6) mottles; siltloam; strong fine subangular blocky; slightly sticky, slightly plastic, friable moist; common pores of all sizes; many roots of all sizes; abrupt smooth boundary.

C	9-19	: Light yellowish brown (10 YR 6/4); (slightly gravelly sandy) loam; weak very fine and fine subangular blocky; non sticky, non plastic, friable moist; few to common very fine, fine and few medium, coarse pores; common roots of all sizes; abrupt smooth boundary.
2A	19-22	: Yellowish brown (10 YR 5/4); (slightly gravelly) clay; moderate fine and medium subangular blocky; sticky, plastic, friable moist; common pores of all sizes; common roots of all sizes; clear smooth boundary.
2BA	22-30/33	: Yellowish brown (10 YR 5/6); clay; strong, fine and medium subangular blocky; sticky, plastic, firm moist; few very fine, fine and medium pores; common roots of all sizes; clear wavy boundary.
2Bw1	30/33-52	: Heterogeneous colour, yellowish brown (10 YR 5/6) and (10 YR 5/8) and pale brown (10 YR 6/3); (slightly gravelly) clay; sticky; plastic, firm moist; few very fine, fine and medium pores; common very fine, fine and few medium roots; clear smooth boundary.
2Bw2	52-70	: Grey (10 YR 5/1) with many medium and coarse prominent sharp light olive brown (2.5 Y 5/4) mottles; slightly gravelly clay; moderate medium angular sticky; sticky, plastic, firm moist; few very fine and fine pores; gravels are strongly calcareous; common very fine, fine and few medium roots; clear smooth boundary.
2BC1	70-87	: Grey (10 YR 5/1) and grayish brown (10 YR 5/2) with many medium and coarse prominent sharp light olive brown (2.5 Y 5/4) mottles; slightly gravelly slightly stony clay; sticky, plastic, firm moist; few very fine and fine pores; gravels and stones are strongly calcareous; few very fine and fine roots; clear smooth boundary.
2BC2	87-130+	: Gray (5 YR 5/1) with common fine distinct sharp light olive brown (2,5 Y 5/4), common coarse prominent sharp strong brown (7.5 YR 5/8) and few fine prominent sharp black (N2/0) mottles; slightly gravelly slightly strong clay; strong medium angular blocky; sticky, plastic, firm moist; few very fine and fine pores; gravels strongly calcarrous and matrix calcareous; very few very fine and fine roots.

Plot 315 (Calcaric fluvisol developed in various alluvial sediments)

A1	0-11/19	: Grayish brown (10 YR 5/2); (slightly gravelly) (shells) clay; strong medium and coarse angular blocky; sticky, plastic, firm moist; few very fine and fine pores; strongly calcareous; common very fine and fine roots; clear wavy boundary.
A12	11/19-14/22:	Dark gray (10 YR 4/1); (slightly gravelly (shells)) clay; moderate fine and medium subangular blocky; sticky, plastic, friable moist; many very fine, fine and common medium pores; strongly calcareous; common very fine and fine roots; abrupt irregular boundary.
C1	14/22-27/30:	Light brownish gray (2.5 Y 6/2); (slightly gravelly) silty clay; slightly sticky; slightly plastic, very friable moist; common very fine and fine pores; calcareous; few very fine and fine roots; abrupt smooth boundary.
C2	27/30-28/32:	White (10 YR 8/2); sand; single grain; non sticky, non plastic, loose moist; strongly calcareous very few roots; abrupt irregular boundary.
C3	28/32-29/51:	Gray (10 YR 5/1) with common fine distinct sharp (dark) yellowish brown (10 YR 4/6, 10 YR 3/6 and 10 YR 5/8) mottles; (slightly gravelly (shells)) clay; moderate medium columnar breakable into fine and medium angular blocky; sticky, plastic, friable moist; few very fine, fine and common medium, coarse pores; strongly calcareous; common very fine, fine and medium roots; abrupt irregular boundary.
C4	29/51-65+	: Light gray (2.5 Y 7/2) with many fine and medium prominent strong brown (7.5 YR 5/8) mottles; (gravelly (coral debris)) silt; non sticky, non plastic; very friable moist; common very fine, fine and few medium pores; strongly calcareous; very fine and fine roots.

Plot 318 (Dystric gleysol developed in alluvial silty clay)

O	2-0	:
A	0-9/18	: Black (N2/0) with white (10 YR 8/2) sand grains; (slightly gravelly) clay; strong medium granular and moderate fine subangular blocky; slightly sticky, slightly plastic, very friable moist; many very fine, fine and few medium pores; strongly calcareous; many roots of all sizes; abrupt irregular boundary.
BA	9/18-23	: Grayish brown (10 YR 5/2) with common fine distinct sharp yellowish brown (10 YR 5/8) mottles; very gravelly clay; moderate fine subangular blocky, sticky, plastic, friable moist; common very fine and fine pores; strongly calcareous; common roots of all siezes; clear wavy boundary.
Bw1	23-56	: Grayish brown (10 YR 5/2) and yellowish brown (10 YR 5/4) with common fine distinct sharp yellowish brown (10 YR 5/8) mottles; very gravelly silty clay; sticky, plastic, friable moist; very fine and fine pores; strongly calcareous; common very fine, fine and fine medium roots; abrupt smooth boundary.
Bw2	56-100+	: (light) gray (10 YR 6/1) and light brownish gray (10 YR 6/2) with many medum and coarse prominent sharp yellowish brown (10 YR 5/8) mottles; very gravelly; silty clay weak fine subangular blocky; slightly sticky, slightly plastic very friable

moist; few very fine and fine pores; strongly calcareous; very few very fine and fine roots.

Plot 319 (Poorly developed gleyic luvisol developed in clayey material of unknown origin)

O	3-0	:
A	0-2	: Dark yellowish brown (10 YR 3/4); loam; moderate very fine and fine subangular blocky; slightly sticky, slightly plastic, friable moist; common very fine, fine and few medium pores; many roots of all sizes; abrupt smooth boundary.
Bw	2-12	: Dark yellowish brown (10 YR 4/5) and (10 YR 4/4); clayloam; strong fine and medium subangular blocky; slightly sticky, slightly plastic, friable moist; common very fine, fine and few medium pores; many roots of all sizes; abrupt smooth boundary.
C	12-28	: Yellowish brown (10 YR 5/4); slightly gravelly loam; weak fine subangular blocky; non sticky, non plastic, very friable moist; common very fine, fine and few medium pores; common roots of all sizes; abrupt wavy boundary.
2A	28-43	: (Dark) yellowish brown (10 YR 5/4 and 10 YR 4/4) with common fine faint sharp strong brown (7.5 YR 5/8) mottles; clayloam; strong fine angular blocky; sticky, plastic, friable moist; common very fine, fine, medium and few coarse pores; common roots of alle sizes; clear wavy boundary.
2BA	43-60	: Yellowish brown (10 YR 5/4) with many fine and medium distinct sharp dark yellowish brown (10 YR 4/6), common fine distinct sharp strong brown (7.5 YR 5/8), few fine distinct sharp black (N2/0) and few fine faint sharp red (2.5 YR 4/6) mottles; clayloam; moderate fine angular blocky; common very fine, fine and few medium pores; few very fine, fine and medium roots; clear wavy boundary.
2Bw1	60-79	: Brown (10 YR 5/3) with many fine and medium prominent sharp yellowish red (5 YR 4/6), few fine distinct sharp red (2.5 YR 4/6) and few fine distinct sharp black (N2/0) mottle slightly gravelly clay; moderate fine angular blocky; sticky, plastic, firm moist; few very fine, fine and medium pores; few very fine and fine roots; clear wavy boundary.
2Bw2	79-125+	: Grayish brown (10 YR 5/2) with many coarse prominent sharp red (2.5 YR 4/6), common fine and medium distinct sharp yellowish brown (10 YR 5/6) and few fine distinct sharp black (N2/0) mottles; slightly gravelly clay; moderate coarse angular blocky; sticky, plastic, firm moist; few very fine, fine and medium pores; few very fine and fine roots.

Note: An augering in the bottom of the pit till 2 m has been made and showed dominating grayish colours with yellowish brown mottles. No stones were found.

Plot 321 (Calcaric regosol developed on coral)

O	3-0	:
A	0-10/12	: Black (N2/0), very dark brown (10 YR 2/2) and white (10 YR 8/2), gravelly loam; strong fine and medium granular; non sticky, non plastic, very friable, moist; strongly calcareous, many roots of all sizes; abrupt wavy boundary.
C	10/12-90+	: Heterogeneous colour, light brownish gray (10 YR 6/4), light yellowish brown (10 YR 6/3), and white (10 YR 8/1); gravelly stony sand; single grain; non sticky, non plastic, loose moist; strongly calcareous, very few roots.

Plot 324 (Eutric cambisol developed on limestone)

O	3-0	:
A	0-4	: Black (N2/0); silty clayloam; strong fine granular, slightly sticky, slightly plastic, very friable moist; many roots of all of all sizes; clear smooth boundary.
Bw	4-9	: Dark brown (10 YR 3/3) mixed with A1 material; slightly gravelly silty; clay-loam; strong fine; subangular blocky; slightly sticky, slightly plastic, very friable moist; common very fine, fine and few medium pores; many roots of all sizes; abrupt smooth boundary.
C	9-14	: Very pale brown (10 YR 7/4) mixed with B2 material; slightly gravelly loamy sand; weak fine subangular blocky; non sticky, non plastic, very friable moist; common very find and fine pores; common roots of all sizes; abrupt irregular boundary.
2BA	14-26/32	: Dark yellowish brown (10 YR 4/4); clay; strong fine subangular blocky; sticky, plastic, firm moist, many very fine, fine and common medium pores; common roots of all sizes; clear smooth boundary.
2Bw2	26/32-33/45:	Dark yellowish brown (10 YR 4/6), slightly gravelly slightly stony clay; strong fine subangular blocky; sticky; plastic; friable moist; common very fine, fine and medium pores; gravels and stones are strongly calcareous; common roots of all sizes; abrupt smooth boundary.
2BC	33/45-60+	: Dark yellowish brown (10 YR 4/6); slightly gravelly very stony clay; weak fine subangular blocky; sticky; plastic; friable moist; common very fine, fine and medium pores; gravels and stones are strongly calcareous; few very fine and fine roots.

Plot 325 (Gleyic cambisol developed on parent material of unknown origin)

O	2-0	:
A	0-3/5	: Dark brown (10 YR 3/3); sandy loam; strong fine granular; slightly sticky, non plastic, very friable moist; many roots of all sizes; abrupt wavy boundary.
Bw	3/5-14	: Yellowish brown (10 YR 5/4) with common fine and medium prominent sharp yellowish red (5 YR 5/8) mottles; (sandy) loam; weak fine angular blocky; slightly sticky; slightly plastic, friable moist; few to common very fine and fine pores; common roots of all sizes; clear smooth boundary.
2Bw1	14-25	: Dark yellowish brown (10 YR 4/6) and yellowish brown (10 YR 5/6) with few fine faint sharp yellowish red (5 YR 5/8) mottles; clayloam; moderate fine subangular blocky; sticky; slightly plastic, friable moist; common very fine, fine and few medium pores; common roots of all sizes.
2Bw2	25-31	: Essentially similar to horizon above but with frequent, medium, hard irregular iron (?) nodules abrupt smooth boundary.
2Bw3	31-50	: Heterogenous colour, yellowish brown (10 YR 5/6), strong brown (7.5 YR 5/6) and yellowish red (5 YR 5/8) with few fine faint sharp yellowish red to red (3.5 YR 5/8) mottles; gravelly sandy clay; weak fine subangular blocky; sticky, plastic friable moist; common very fine, fine and few medium pores; very few, medium, hard, irregular iron (?) nodules; few very fine, fine and medium roots; clear smooth boundary.
2Bw4	50-69	: Heterogenous colour, yellowish brown (10 YR 5/6), pale brown (10 YR 6/3), and yellowish red (5 YR 5/8) with common fine prominent sharp red (2.5 YR 4/8) mottles; gravelly sandy clay, weak fine angular blocky; sticky, plastic, friable moist; few to common very fine and fine pores; very few very fine and fine roots; clear smooth boundary.
2Bw5	69-87	: Heterogenous colour; pale brown (10 YR 6/3) and yellowish brown (10 YR 5/8) with many fine prominent sharp red (2.5 YR 4/8) mottles; slightly gravelly sandy clay; weak fine angular blocky; sticky, plastic, friable moist; common very fine and fine pores; very few very fine and fine roots; gradual smooth boundary.
2BC1	87-114	: Light gray (10 YR 7/2) with common fine distinct sharp yellowish brown (10 YR 5/8) and many fine and medium prominent sharp red (2.5 YR 4/8) mottles; slightly gravelly sandy clay; weak fine angular blocky; sticky, plastic, friable moist; few very fine and fine pores; very few very fine and fine roots; gradual smooth boundary.
2BC2	114-135+	: Light gray (10 YR 7/2) with common fine distinct sharp red (2.5 YR 4/8) and many medium prominent sharp yellowish brown (10 YR 5/8) mottles; slightly gravelly sandy clay; weak fine angular blocky; sticky, plastic, friable moist; very few fine and fine pores; very few very fine and fine roots.

Plot 326 (Gleyic cambisol developed on parent material of unknown origin)

O	2-0	:
A	0-3	: Very dark grayish brown to dark brown (10 YR 3/2.5); clay; strong fine granular; slightly sticky, slightly plastic, friable moist; many roots of all sizes, abrupt smooth boundary.
Bw	3-19	: Dark yellowish brown (10 YR 4/4); clay; strong fine subangular blocky; slightly sticky, slightly plastic, friable moist; common very fine, fine and medium pores; many roots of all sizes; abrupt smooth boundary.
C	19-22	: Yellowish brown (10 YR 5/4); sandy loam; weak fine subangular blocky; slightly sticky, non plastic, friable moist; common very fine and fine pores; many roots of all sizes; abrupt broken boundary.
2Bw1	22-39	: Heterogenous colour, yellowish brown (10 YR 5/4), dark yellowish brown (10 YR 4/4) and black (N2/0); clay; moderate fine subangular blocky; sticky, plastic, friable moist; common very fine, fine and medium pores; common roots of all sizes; clear smooth boundary.
2Bw2	39-62	: Heterogenous colour, yellowish brown (10 YR 5/4 and 10 YR 5/6) and black (N2/0); clay; weak fine subangular blokcy; sticky, plastic, friable moist; common very fine and fine pores; few very fine roots; clear smooth boundary.
2Bw3	62-90+	: Heterogenous colour, dark yellowish (10 YR 4/6), black (N2/0) and yellowish brown (10 YR 5/6); clay; weak fine subangular blocky; sticky, plastic, friable moist; common very fine and fine pores, few very fine roots.

Plot 332 (Dystric gleysol developed in alluvial silty clay)

O	3-0	:
A1	0-5	: Black (N2/0); silt loam; moderate very fine and fine subangular blocky; slightly sticky, slightly plastic, very friable moist; common very fine, fine and few medium pores; many very fine, fine, medium and common coarse roots; clear smooth boundary.
A2	5-13	: Very dark grayish brown (10 YR 3/2); silty clayloam; moderate very fine and fine subangular blocky; slightly sticky, slightly plastic, very friable moist; few to common very fine, fine and very few medium pores; many very fine, fine, medium and common coarse roots; clear wavy boundary.

Bw1 13-21 : Dark grayish brown (10 YR 4/2) and brown (10 YR 5/3); silty clayloam; moderate fine subangular blocky; slightly sticky, slightly plastic, friable moist; common very fine and fine pores; many very fine, fine, medium and few coarse roots; clear wavy boundary.

Bw2 21-36 : Yellowish brown (10 YR 5/4) and brown (10 YR 5/3) with few fine faint sharp strong brown (7.5 YR 5/8) mottles; clay; weak fine and medium subangular blocky; slightly sticky, slightly plastic, friable moist; common very fine, fine and few medium pores; common very fine, fine, medium and few coarse roots; clear smooth boundary.

Bw3 36-62 : Yellowish brown (10 YR 5/6) and (10 YR 5/4) with common fine faint sharp strong brown (7.5 YR 5/5) mottles; clay, moderate medium subangular blocky, sticky, plastic, friable moist; common very fine, fine and medium pores; common very fine, fine and few medium, coarse roots; clear smooth boundary.

BC1 62-89 : Grayish brown (10 YR 5/2) and yellowish brown (10 YR 5/4) with common fine distinct sharp yellowish brown (10 YR 5/8) and strong brown (7.5 YR 5/8) mottles; slightly stony slightly gravelly silty clay; weak medium subangular blocky, sticky, plastic, very friable moist; many very fine, fine and common medium pores; small pieces of coral and white coloured shells: calcareous (matrix); common very fine, fine and few medium coarse roots; clear smooth boundary.

BC2 89-110+ : Grayish brown (10 YR 5/2) with many fine and medium distinct diffuse yellowish brown (10 YR 5/6 and 10 YR 5/8) mottles; slightly stone gravelly silty clay; weak medium subangular blocky; sticky, plastic, very friable moist; many very fine, fine and common medium pores, small pieces of coral and white coloured shell calcareous (matrix); few very fine and fine roots.

Note: Groundwater occurs at 110 cm.

Plot 335 (Dystric nitosol developed on sedimentary rock)

A0 3-0 :

A 0-2 : Dark yellowish brown (10 YR 4/4); (sandy) silty clayloam; moderate very fine and fine subangular blocky; slightly sticky, slightly plastic, very friable moist; many very fine, fine and common medium pores; many roots of all sizes; abrupt smooth boundary.

Bw 2-12/14 : Dark yellowish brown to strong brown (9 YR 4/6); (sandy) silty clayloam; moderate fine sbuangular blocky; slightly sticky, slightly plastic, very friable moist; common very fine, fine and few medium pores; many roots of all sizes, abrupt wavy boundary.

C 12/14-16/17: Yellowish brown (10 YR 5/4), partly mixed with B2 material; sandy loam; weak fine subangular blocky; non sticky, slightly plastic, very friable moist; many very fine, fine and common medium pores; common very fine, fine, medium and few coarse roots; abrupt wavy boundary.

2BA 16/17-28 : Yellowish red to strong brown (6 YR 5/8); clay; moderate very fine and fine subangular blocky; sticky, slightly plastic, friable moist; many very fine, fine, medium and common coarse pores; common very fine, fine and few medium, coarse roots; clear smooth boundary.

2Bw1 28-41 : Yellowish red (5 YR 5/8); clay; moderate fine subangular blocky; sticky, slightly plastic, firm moist; many very fine, fine, common medium and few coarse roots; common very fine, fine and few medium, coarse roots; clear smooth boundary.

2Bw2 41-66 : Yellowish red (5 YR 5/8) with common fine and medium distinct sharp light gray (10 YR 7/2) spots; clay; strong fine and medium subangular blocky; sticky, plastic, firm moist; common very fine, fine and few medium pores; few very fine, fine and very few medium roots; clear smooth boundary.

2Bw3 66-93 : Yellowish red (5 YR 5/8) with many fine and medium distinct sharp light gray (10 YR 7/2) and common fine distinct sharp yellowish red to red (4 YR 5/8) spots; clay; strong medium subangular blocky; sticky, plastic, firm moist; common very fine, fine and few medium pores; few very fine and fine roots; gradual smooth boundary.

2Bw4 93-124 : Heterogeneous colour, 45% light gray (10 YR 7/2) 35% yellowish red (5 YR 5/8) and 20% yellowish red to red (4 YR 5/8); clay; moderate fine and medium subangular blocky; sticky, plastic, friable moist; common very fine, fine and few medium pores; very few very fine and fine roots; abrupt smooth boundary.

2BC 124-150+ : Heterogeneous colour, light gray (10 YR 7/2), 25% red (2.5 YR 5/8), 20% yellowish red (5 YR 5/8) and 5% red (2.5 YR 4/6); slightly gravelly clay; moderate fine and medium subangular blocky; sticky, plastic, firm moist; few very fine and fine pores;

Note: On the transition of the B24 to the B31 horizon some small stones occur with red colours (2.5 YR 4/6 and 10 R 4/6).
Vague indications for clay illuviation have been found in the B22 and B23.

Plot 336 (Gleyic luvisol developed in clayey material of unknown origin)

A 0-8/12 : Dark brown (10 YR 3/3); sandy clay loam; moderate very fine and fine subangular blocky; slightly sticky, slightly plastic, very friable moist; common very fine, fine and few medium pores; weakly calcareous; many very fine, fine, medium and few coarse roots; abrupt wavy boundary.

Bw1 8/12-24 : Brownish yellow (10 YR 6/6) and 20% yellowish brown (10 YR 5/4); clay; moderate fine and medium subangular blocky; sticky, plastic, friable moist; common very fine, fine and medium pores; common very fine, fine and few medium, coarse roots; clear smooth boundary.

Bw2 24-37/40 : Pale brown (10 YR 6/3) and brownish yellow (10 YR 6/6) with 5% black (N2/0); clay; weak medium and coarse subangular blocky; sticky, plastic, friable moist; few to common very fine, fine and few medium pores; few to common very fine, fine and few medium roots; clear smooth boundary.

BC1 37-51 : Light yellowish brown (10 YR 6/4) with many medium prominent sharp brownish yellow (10 YR 6/8) motthles; gravelly clay; sticky, plastic, friable moist; few very fine, fine and medium pores; few very fine and fine roots; abrupt broken boundary.

BC2 37/51-79/61: Light gray to gray (10 YR 6/1) with many medium prominent sharp brownish yellow (10 YR 6/8) and many fine distinct sharp yellowish brown (10 YR 5/4) mottles; slightly stony gravelly clay; sticky, plastic, friable moist; few very fine and fine pores; strongly calcareous gravels and stones, clay calcareous; very few very fine and fine roots; clear wavy boundary.

BC3 59/62-100+ : Light gray to gray (5 Y 6/1) with many medium prominent sharp yellowish brown (10 YR 5/8) mottles; sandy clay; moderate medium and coarse angular blocky; sticky, plastic, friable moist; few very fine and fine pores sand as well as clay calcareous; very few very fine and fine roots.

Note: In the B33 weakly developed slickensides occur.

Part 2

Analytical data

Note that not for all reference profiles analytical data are available. Moreover of some reference profiles, only part of the horizons were samples.

Legend:
The depth is given in cm.
The particles size classes, CaCO3 content, the organic C and N content and the base saturation (B.S.) are given in percentages.
The exchangeable bases, including the cation-exchange capacity (C.E.C.) are given in mmol (+)/kg.

The P-Olsen is given in mg/kg.

The particle size classes are defined as follows:

sand	2-0.05 mm
silt	0.05-0.002 mm
clay	0.002-0 mm
very coarse sand	2-1 mm
coarse sand	1-0.5 mm
medium sand	0.5-0.25 mm
fine sand	0.25-0.10 mm
very fine sand	0.10-0.05 mm
coarse silt	0.05-0.02 mm
fine silt	0.02-0.002 mm
gravel	more than 2 mm

For the mineralogical data the following codes are used:

kaol	kaolinite
mi/ill	mica/illite
chlor	chlorite
smec	smectite
mix	chloritized smectite
quartz	quartz
feld	feldspars
goeth	goethite
crist	cristobalite
(+)	very small amount
+	small amount
+(+)	small to moderate amount
++	moderate amount (higher amounts do not occur)

In general:

-	not detected
blanc	not analyzed

Plot no.	146					284							292						
Depth from	0	2	8	13	32/49	0	4	15	22	36	49	73	0	6	18	30	51	74	103
to	2	8	13	32/49	60+	4	15	22	36	49	73	96/108	6	18	30	40	61	103	140+
sand	51.8	48.0	41.7	49.3	72.7	27.1	24.6	32.0	8.4	5.9	4.3	5.7	20.6	26.3	36.3	15.9	6.7	5.0	3.8
silt	22.4	24.8	46.3	21.2	15.0	39.7	40.8	48.5	42.1	25.6	17.5	17.3	30.1	34.0	48.1	19.7	11.4	11.2	9.8
clay	24.8	27.3	11.9	29.7	13.4	33.2	34.6	19.5	59.5	68.7	79.0	78.2	49.3	39.8	15.6	64.3	82.0	83.9	86.5
v. coarse sa.	1.0	0.9	3.4	1.7	0.6	1.2	1.7	5.8	0.7	0.5	0.3	0.8	1.2	1.4	4.6	0.7	0.2	0.2	0.1
coarse sa.	8.6	8.5	8.4	9.6	11.6	4.2	4.2	6.9	1.0	0.7	0.4	0.5	3.3	4.0	6.9	1.0	0.4	0.3	0.3
medium sa.	23.6	20.6	11.3	21.8	38.0	7.1	5.9	5.4	1.1	0.5	0.4	0.5	4.6	6.8	7.5	2.9	1.2	1.0	0.7
fine sa.	12.5	11.1	9.8	10.1	15.6	7.7	6.1	6.7	2.6	1.8	1.4	1.2	6.8	8.4	8.8	7.7	3.3	2.4	1.8
very fine sa.	6.1	6.9	8.8	5.5	5.8	6.9	6.7	7.2	3.0	2.4	1.8	1.5	4.7	5.7	8.5	3.6	1.6	1.1	0.9
coarse silt	7.6	6.9	13.9	6.2	7.6	11.6	11.7	17.5	5.5	6.0	0.4	1.9	9.3	10.5	13.8	5.2	3.3	4.2	1.4
fine silt	15.8	17.9	32.4	15.0	7.4	28.1	29.1	31.0	26.6	19.6	17.1	15.4	20.8	23.5	34.3	14.5	8.1	7.0	8.4
gravel	-	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaCO3					84.9														
org.C	4.7	1.9	0.8	4.7	0.1	7.9	2.2	0.7	1.7	1.2	0.9	0.6	7.2	1.7	0.6	1.3	1.1	1.0	0.8
org.N													0.5	0.2	0.1	0.2	0.2	0.1	0.1
pH-H2O	6.7	5.4	6.2	6.7	8.8	6.2	5.7	5.9	5.9	5.8	5.5	7.7	6.1	5.6	5.1	5.6	5.3	5.2	5.2
pH-KCl	6.5	4.4	4.8	6.5	8.3	5.5	4.5	4.5	4.4	4.0	4.0	6.6	5.2	4.4	4.4	4.6	4.2	3.9	3.9
Exch.bases:																			
Ca	194	69	24	46		306	150	107	287	266	295	605	160	35	14	57	53	42	45
Mg	60	28	11	22		72	56	35	90	73	46	36	37	23	9	36	37	29	22
Na	1	3	3	2		0	0	2	4	4	2	2	2	1	3	1	0	1	1
K	20	5	3	2		11	7	3	3	3	3	3	9	4	3	9	3	3	2
sum	274	105	40	72		389	213	146	384	346	346	647	207	63	29	102	93	75	69
C.E.C.	347	221	116	244		443	227	122	341	361	366	524	402	184	100	240	257	255	255
B.S.	79	47	35	30		88	94	>100	>100	96	94	>100	52	34	29	42	36	29	27
P.Olsen	108.0	19.1	30.9	57.6	24.9														
kaol.	+	+	+	+	+	+(+)	+(+)	+	+	+(+)	++	+	+	+	+	++	++	++	++
mi/ill.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(+)	(+)	(+)	(+)
chlor.	-	(+)	(+)	(+)	-	-	-	-	-	-	-	-	-	-	(+)	(+)	-	-	-
smec.	-	-	-	-	-	(+)	(+)	(+)	(+)	(+)	(+)	++	-	-	-	-	-	-	-
mix	+	+	(+)	+	+	-	-	-	-	-	-	-	(+)	+	(+)	+	+	+	+
quartz	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
feld	(+)	(+)	(+)	(+)	(+)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
goeth.	+	+	(+)	+	+	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
crist.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

B10

Plot no.	303				304							306							
Depth from	0	11	49	122	0	4	14	20	52	87	115	0	3	15	23	25	42	53	68	91
to	11	18	83	160+	4	14	20	52	87	115	150+	3	15	23	25	42	53	68	91	130+
sand	26.9	39.7	4.4	4.9	58.5	52.4	46.0	49.4	38.3	40.0	40.3	19.7	19.5	31.4	9.6	5.8	3.4	2.8	2.1	4.3
silt	35.0	45.7	33.0	37.4	17.7	17.7	33.8	16.1	14.2	14.4	13.1	45.6	42.2	45.6	47.9	48.3	42.6	37.6	33.9	30.6
clay	38.0	14.4	62.7	57.6	23.8	29.9	20.3	34.5	47.5	45.6	46.6	34.7	38.2	23.0	42.6	46.0	53.9	59.6	64.0	65.1
v. coarse sa.	2.1	4.6	0.1	0.2	0.3	0.7	3.9	0.3	0.2	0.3	0.4	1.2	1.1	4.6	1.0	0.3	0.3	0.1	0.2	1.6
coarse sa.	5.8	8.0	0.4	0.5	1.5	1.7	5.4	1.2	0.7	0.8	0.9	2.9	3.0	5.9	1.7	0.8	0.4	0.3	0.3	0.6
medium sa.	7.4	8.6	0.7	0.8	5.3	4.9	6.2	3.5	2.4	2.7	2.6	5.1	5.2	5.7	2.2	1.1	0.5	0.4	0.3	0.4
fine sa.	7.1	9.4	1.5	1.6	23.5	20.5	13.6	18.7	14.7	15.0	15.8	5.3	5.6	7.1	2.2	1.8	0.9	0.8	0.5	0.6
very fine sa.	4.5	9.1	1.7	1.8	27.9	24.6	16.9	25.7	20.3	21.2	20.6	5.2	4.6	8.1	2.5	1.8	1.3	1.2	0.8	1.1
coarse silt	9.2	13.3	6.9	8.8	7.5	6.6	9.1	4.5	4.2	3.1	3.3	10.9	9.5	12.1	10.1	11.6	9.1	7.9	7.5	6.4
fine silt	25.8	32.4	26.1	28.6	10.2	11.1	24.7	11.6	10.0	11.3	9.8	34.7	32.7	33.5	37.8	36.7	33.5	29.7	26.4	24.2
gravel	-	-	-	-	-	1.0	2.1	-	-	-	-	-	-	3.9	-	-	-	-	-	-
CaCO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
org.C	5.4	1.4	1.0	0.5	2.7	1.7	1.0	0.5	1.1	0.5	0.1	4.8	1.0	0.6	1.2	1.0	1.1	1.0	1.0	1.2
org.N	0.3	0.1	0.1	<0.05																
pH-H2O	4.6	5.0	4.8	4.7	4.3	4.4	5.1	5.2	4.9	4.9	5.0	5.5	5.6	6.0	6.0	6.1	5.7	5.2	5.1	5.3
pH-KCl	4.0	4.4	4.0	3.9	3.8	3.9	4.2	3.8	3.8	3.9	3.9	4.8	4.3	4.4	4.4	4.4	4.1	3.7	3.7	3.9
Exch.bases:																				
Ca	0	4	0	0	37	6	0	0	0	2	0	92	65	41	80	68	82	59	62	71
Mg	9	2	11	5	19	14	7	23	18	8	7	94	69	40	91	111	111	84	70	77
Na	5	3	0	2	0	1	2	1	2	1	1	2	3	3	4	6	6	5	5	5
K	4	3	1	1	6	4	4	3	3	3	3	15	8	4	5	3	3	3	2	2
sum	17	12	12	8	62	25	13	26	23	14	11	202	145	88	180	188	201	150	129	155
C.E.C.	212	99	135	120	132	128	83	112	148	135	130	940	576	504	643	622	551	508	480	439
B.S.	8	12	9	7	47	20	15	23	16	10	8	62	66	76	66	66	68	49	42	54
P.Olsen					10.3	3.2	2.1	0.5	1.1	0.1	0.1									
kaol.	++	+	++	++	+(+)	++	+(+)	++	++	++	++	+(+)	++	+(+)	++	++	++	++	++	++
mi/ill.	-	-	-	-	(+)	(+)	(+)	(+)	(+)	(+)	-	-	-	-	-	-	-	-	-	-
chlor.	-	+	-	-	-	-	(+)	-	-	-	-	-	-	(+)	-	-	-	-	-	-
smec.	-	-	-	-	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
mix	(+)	(+)	(+)	(+)	+	+	+(+)	+	+	+	+	+	+	+(+)	+	+	+	+	+	+
quartz	(+)	(+)	-	-	(+)	(+)	(+)	(+)	(+)	(+)	(+)	-	-	-	-	-	-	-	-	-
feld	-	-	-	-	(+)	(+)	(+)	(-)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(-)	(+)
goeth.	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(-)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
crist.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

B11

Plot no.	308							310			314				315 (continued on p. 813)				
Depth from	0	4	17	24	39	59	69	0	14/23	25	0	9	32	70	0	11/19	14/22	27/30	28/32
to	4	17	24	32	59	69	100+	14/23	25	35	9	19	52	87	11/19	14/22	27/30	28/32	29/51
sand	33.4	32.7	39.2	32.1	27.6	33.5	66.2	73.7	64.4	58.9	18.9	31.9	0.6	24.9	21.4	1.2	19.0	88.6	23.5
silt	42.1	43.4	44.4	41.1	40.3	34.5	23.6	15.5	22.4	24.4	55.3	48.8	31.3	22.3	20.8	14.4	69.0	2.4	10.9
clay	24.4	23.9	16.4	26.8	32.1	31.9	10.2	10.9	13.1	6.7	25.8	19.2	68.0	52.6	57.8	84.4	20.9	9.0	65.6
v. coarse sa.	0.4	1.3	4.5	0.6	0.3	2.5	5.1	2.1	2.7	0.3	0.6	7.2	0.0	0.5	1.9	0.0	0.2	8.0	0.0
coarse sa.	2.9	4.1	6.6	2.7	2.0	5.3	13.5	4.7	5.3	0.5	3.0	6.3	0.1	2.3	3.3	0.2	0.4	28.3	0.2
medium sa.	8.5	8.1	8.0	7.6	6.0	7.5	18.3	12.3	11.3	8.0	4.5	5.2	0.1	6.1	2.8	0.2	1.1	34.5	1.2
fine sa.	12.9	11.1	11.3	12.2	11.8	12.1	20.2	48.1	36.2	54.2	5.4	6.6	0.2	11.6	6.0	0.4	2.9	15.3	15.6
very fine sa.	8.7	8.1	8.8	9.0	7.5	6.1	9.1	6.5	8.9	5.9	5.4	6.6	0.2	4.4	7.4	0.4	5.6	2.5	6.5
coarse silt	13.8	12.1	11.8	12.0	10.5	8.7	8.3	4.0	4.2	2.0	19.6	14.2	5.9	3.9	3.5	5.2	21.1	1.8	3.5
fine silt	28.3	31.3	32.6	29.1	29.8	25.8	15.3	11.5	18.2	22.4	35.7	34.6	25.4	18.4	17.3	9.2	47.9	0.6	7.4
gravel	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaCO3								46.5	65.5	57.6	1.3	-	1.9	10.2	26.0	44.3	9.9	57.0	10.5
Org.C	5.6	1.6	0.7	0.8	0.7	0.5	0.1	10.0	1.6	6.6	3.8	0.8	0.4	0.2	3.7	4.6	0.3	0.6	1.5
Org.N								0.8	0.2	0.7	0.3	0.1	0.1	<0.05					
pH-H2O	5.7	4.9	5.6	5.6	5.7	5.8	6.1	7.3	8.1	7.5	5.4	5.7	5.6	8.0	7.4	7.1	8.1	8.7	8.1
pH-KCl	5.1	4.0	4.3	4.2	4.2	4.1	4.2	6.9	7.4	7.2	4.4	4.3	3.9	7.0	7.0	6.8	7.3	8.3	7.1
Exch.bases:																			
Ca	131	39	26	62	82	92	85	349	77	239	57	39	179	254	201	203	114		183
Mg	73	44	19	49	42	44	73	21	4	8	27	21	57	63	87	63	47		107
Na	3	2	3	2	1	1	1	0	1	0	1	1	1	1	11	6	7		14
K	16	8	6	7	7	6	3	4	1	1	6	3	4	2	8	6	6		7
Sum	224	93	54	120	131	142	161	375	83	248	91	64	241	320	307	277	174		311
C.E.C.	329	181	106	178	197	208	219	571	771	918	240	130	366	326	505	462	250		486
B.S.	68	51	51	67	67	68	74	66	82	60	38	49	66	98	61	60	70		64
P.Olsen	19.5	5.5	2.0	1.6	0.6	0.4	0.3								11.4	20.0	3.2	3.3	9.1
kaol.	+	+	+	+	+	+	(+)	-	-	(+)	+	+	++	++	-	-	+	+	+
mi/ill.	-	-	-	-	-	-	-	-	-	-	(+)	(+)	(+)	(+)	-	-	-	-	-
chlor.	-	-	(+)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
smec.	(+)	(+)	(+)	(+)	(+)	(+)	-	-	-	(+)	+(+)	(+)	++	++	++	+	+(+)	+(+)	++
mix	+	+	+	+	+	(+)	(+)	-	-	-	-	-	-	-	+(+)	++	+(+)	+(+)	+(+)
quartz	-	-	-	-	-	-	-	-	-	-	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
feld	(+)	(-)	(+)	(+)	(+)	(+)	(+)	-	-	-	-	-	-	-	(+)	-	-	-	(+)
goeth.	-	-	-	-	-	-	-	(+)	(+)		(+)	(+)	(+)	(+)	(+)	-	-	-	(+)
crist.	++	++	++	++	++	++	++	-	-	-	-	-	-	-	-	-	-	-	-

Plot no.	315	318				319							321	
Depth from	29/51	0	9/18	23	56	0	2	12	28	43	60	79	0	10/12
to	65+	9/18	23	56	100+	2	12	28	43	60	79	125+	10/12	90+
sand	6.8	19.7	6.5	1.1	1.3	34.3	30.6	33.9	29.6	26.6	19.2	14.1	33.7	2.5
silt	88.5	33.0	29.3	54.5	78.7	39.5	36.3	46.9	31.0	33.6	22.3	22.9	39.9	37.3
clay	4.7	47.3	64.1	44.4	19.9	26.2	33.2	19.2	39.4	39.7	58.4	63.1	26.4	602
v. coarse sa.	0.0	0.4	0.4	0.0	0.0	0.6	1.4	4.4	0.3	0.2	0.3	0.2	6.3	0.0
coarse sa.	0.0	4.8	1.8	0.1	0.2	1.6	1.9	5.8	0.4	0.3	0.4	0.2	9.9	0.3
medium sa.	0.2	6.6	1.8	0.2	0.2	2.4	2.0	4.2	0.9	0.5	0.3	0.2	6.6	0.3
fine sa.	4.7	4.4	1.1	0.3	0.2	3.7	7.6	6.3	1.5	1.1	0.7	0.4	7.1	0.6
very fine sa.	1.9	3.5	1.4	0.5	0.7	26.1	23.0	13.2	26.5	24.5	17.5	13.1	3.8	1.3
coarse silt	87.3	9.1	10.0	10.1	16.5	17.4	16.6	15.3	16.6	19.5	9.3	10.8	9.6	4.9
fine silt	1.2	23.9	19.3	44.4	62.2	22.1	19.7	31.6	14.4	14.1	13.0	12.1	30.3	32.4
gravel	-	-	80	70	70	-	-	2.1	-	-	-	-	53	60
CaCO3	60.6	17.5	36.6	38.8	74.2								55.8	87.5
Org.C	0.6	10.7	2.4	0.9	0.3	4.7	1.1	0.5	0.3	0.9	0.8	0.5	11.9	0.9
Org.N														
pH-H2O	8.5	7.5	8.0	8.2	8.7	6.0	5.6	6.2	6.1	6.3	6.5	6.4	7.3	8.3
pH-KCl	7.8	7.2	7.3	7.3	7.9	5.6	4.3	4.4	4.5	4.7	4.9	5.0	7.2	8.0
Exch.bases:														
Ca		488				158	79	51	89	89	128	150		
Mg		27				52	46	30	48	42	61	87		
Na		1				2	2	2	2	1	4	8		
K		11				15	9	8	5	4	4	4		
Sum		527				227	136	91	142	137	196	248		
C.E.C.		764				293	189	114	184	187	247	297		
B.S.		69				78	72	79	77	73	79	84		
P.Olsen	11.6	41.5	4.8	1.8	3.1	34.5	3.2	4.0	1.1	1.1	0.6	0.6	56.1	1.7
kaol.	+	+	+	+	+	+(+)	++	+	++	+(+)	+(+)	++	+	+
mi/ill.	-	(+)	(+)	(+)	(+)	(+)	-	-	-	-	-	-	(+)	(+)
chlor.	-	-	-	-	-	-	-	(+)	-	-	-	-	-	-
smec.	++	++	++	+(+)	+	+	(+)	(+)	-	(+)	(+)	(+)	(+)	(+)
mix	+	+	+	+(+)	++	++	++	++	-	+	+(+)	++	+	+
quartz	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
feld	(+)	-	-	-	+	-	-	-	-	-	-	-	-	-
goeth.	-	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(-)	(+)	(+)
crist.	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX C

List of plant-species which were observed in Ujung Kulon during the survey

Column 1: Families and species(groups).

The nomenclature of the ferns generally follows Backer and Posthumus (1939). However, where necessary it has been brought up-to-date*. In such cases (where the nomenclature deviates from Backer and Posthumus) the obsolete synonym is given in column 7. Only the new names, deviating from Backer's nomenclature, are registered fully, i.e. with their author's name.

The nomenclature of the seedplants consequently follows Backer and Backhuizen van den Brink (1963-1968). Only species which are not included in Backer's flora are registered with their authors name.

In cases where species have been mixed up during the fieldwork, species groups have been introduced, which are in most cases also registered in the vegetation tabel (Appendix E).

Column 2: Growth-form

Classification slightly modified after Eiten (1968). See table 2c.

Column 3: Sociological group. See table 9a.

When in brackets: is sufficiently known, because the species concerned is (1) too rare to be included in the vegetation table (i.e. it occurs in less than 10% of the plots in which the sociological group with which it shows most affinity should occur) or (2) the species is included in the vegetation table as a part of a species-group. In the latter case the sociological group to which the species-group as a whole belongs is indicated.

Column 4: included in the vegetation table?
+ = included
- = not included.

Column 5: Sample collected during the survey?
- = no sample collected
(-) = no sample collected, but occurence of the species in the area proven by other collections or reliable literature data.
+ = sample collected.

Comlumn 6: local name.
? = uncertain (very dubious names have been omitted)
pp = pro parte, i.e. the same local name is used for more than one species.

Column 7: miscellaneous remarks.
Including notes on the distribution of species which are not included in the vegetation table or have been combined into species-groups.

* by Dr. P. Hovekamp (Rijksherbarium, Leiden).

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
FERNS						
Ceratopteridaceae						
Ceratopteris thalictroides	AF	69	+	+	-	
Cyatheaceae						
Cyathea cf. junghuhniana Copel.	TP	2	+	+	Paku haji	synonymous with Hemitelia junghuhniana
Gleicheniaceae						
Gleichenia truncata Spr. var. truncata	CF	8	+	+	?Paku rempang (pp)	synonymous with G.laevigata
Hymenophyllaceae						
Trichomanes javanicum	AF	(6)	(+)	+	Paku lenta, ?Paku rempang (pp)	collected in plot 111; in veg.table included 'Paku lenta'
Trichomanes maximum	AF	(6)	(+)	+	Paku lenta, ?Paku rempang (pp)	collected in plot 139; in veg.table included in 'Paku lenta' see also Lindsaea (Polyp.)
Trichomanes obscrurum	AF	1	+	+	Paku toke	-

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Polypodiaceae						
Acrostichum aureum	AF	88	+	+	Paku rawa	
Arcypteris irregularis (Presl.) Holttum	AF	(36)	-	+	Paky (anjing) (pp)	synonymous with Tectar. irregularis; in veg.table included in 'Paku anjing' collected in several localities
Asplenium amboinense	FE	(5)	-	+	-	Found only once (plot 139)
Asplenium nidus	FE	3	+	+	Kadaka (pp)	-
Asplenium tenerum	FE	(1)	-	+	-	found only once (plot 128)
Asplenium unilaterale	AF	(5)	-	+	-	found only once (plot 136)
Bolbitis appendiculata (Willd.) Iwats	AF	(46)	-	+	-	synonymous with Egeriolfia appendiculata rare in Arenga obtusifolia forest
Bolbitis heteroclita	AF	7	+	+	-	-
Davallia denticulata	FE	(82)	-	+	-	found only once (plot 49)
Davallia spec.	FE	62	+	+	-	looks like D.trichomanoides, but both habitat and altitude do not correspond all with data provided by Backer & Posthumus (1939)
Diplazium bantamense	AF	5	+	+	-	
Diplazium pallidum	AF	(5)	-	+	-	found only once (plot 138)
Drynaria sparsisora	FE	82	+	+	Kadaka (pp)	-
Lindsaea obtusa J.Sm.	AF	(6)	(+)	+	-	?synonymous with Lindsaya davalliioides; in veg.table included in "Paku lenta"; collected in plot 109 and 117
Lindsaea repens (Bory) Ymaites var. pectinata (Bl.) Mett.	FE	(6)	(-)	+		Synonymous with Lindsaya pectinata; in veg. table included in 'paku lenta' collected in plot 111; see also Trichoman. (Hymenoph.)
Lomagramma sinuata	CF	(5)	-	+	-	found only once (plot 139)
Microlepia speluncae	AF	(36)	(+)	+	Paku (anjing) (pp)	in veg.table included in "paku anjing"; collected in various localities
Nephrolepsis cf. biserrata	AF	(87)	-	+	Paku laut? (pp)	found only once (plot 48)
Oleandra neriiformis	AF	(14)	-	+	-	found only once (plot 87)
Pteris cretica	AF	(43)	-	+	-	found only once (plot 172)
Pteris ensiformis	AF	(55)	-	+	-	found only once (plot 332)
Pteris cf.quadriaurita	AF	(39)	-	+	-	found only once (plot 151)
Pteris vittata	AF	62	+	+	Paku laut pp	-
Pyrrosia lanceolata	FE	(82)	-	+	Ar.rama tebal	found only once (plot 51)
Stenochlaena palustris	CF	13	+	+	Paku hurang	-
Taenitis blechnoides	AF	6	+	+	Paku hahataan	-
Tectaria cf.melanocaula	AF	10	+	+	-	-
Tectaria cf.siifolia	AF	(11)	-	+	-	found only once (plot 129)
Tectaria vasta	AF	7	+	+	Kadaka (pp)	-
Tectaria spec.	AF	42	+	+	Paku busi	-
Thelypteris malayensis (C.Chr.) Reed	AF	2	+	+	Paku toritip	synonymous with Dryopteris malayensis

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Thelypteris terminans	AF	(36)	(+)	+	Paku (anjing) pp	synonymous with Dryopteris interrupta Ching sensu Backer & Posthumus. With certainty found only once (plot 336, foot of Honje); possibly also in Ujung Kulon. In veg.table included in 'Paku anjing'
Thelypteris triphylla	AF	(5)	-	+		synonymous with Dryopteris triphylla; found only once (plot 111)
Schizaeaceae						
Lygodium circinnatum	CF	50	+	+	(Paku) hata	-
Selaginellaceae						
Selaginella cf.plana	BH	(48)	(+)	+	Paku rane pp	collected in plot 125; in veg.table included in S.spec.
Selaginella spec.	BH	48	+	+	Paku rane	-
SEEDPLANTS						
Acanthaceae						
Acanthus ilicifolius	BS	88	+	(-)	Jeruju	-
Gendarussa vulgaris	BS	(24)	-	+	-	found only twice (plot 282 and 319) possibly indicating ancient grove sites
Hemigraphis bicolor	BH	(58)	-	+	Buntut kucing (pp)	rare; mainly in rattan- and Sterculia foetida vegetation
Hemigraphis cf.javanica	BH	39	+	+	Buntut kucing (pp)	-
Hygrophila erecta	BH	69	+	+	?Mata udang	-
Lepidagathis javanica	BH	44	+	+	Kiwisa	-
Pseuderanthemum diversifolium	BS	44	+	+	Kimelati laut (pp)	-
Rungia blumeana	BH	49	+	+	Kumis ucing (pp)	-
Staurogyne elongata	BH	6	+	+	Reundeuh (pp)	-
Agavaceae						
Pleomele elliptica	RS	4	(+)	+	Hanjuang (pp)	in veg.table included in Pleomele spec.
Pleomele cf.flexuosa	PS	4	(+)	+	Hanjuang (pp)	in veg.table included in Pleomele spec.
Aizoaceae						see: Molluginaceae
Alangiaceae						
Alangium salvifolium	BL	(39)	-	+	-	found only once (plot 167)
Amaranthaceae						
Achyranthes aspera	BH	(31)	-	+	?Kirèm^	found only twice (plot 99 and 270)
Alternanthera sessilis	BH	82	+	+	Rumput urang aring (pp)	-
Amaryllidaceae						
Crinum asiaticum	PS	76	+	+	Bakung, Lili laut	-

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Anacardiaceae						
Anacardium occidentale	ET	(66)	-	+	Jambu mêdê	a single tree was found on the Cijungkulor on grazing ground
Buchanania arborescens	ET	71	+	+	Kitanjung	-
Dracontomelon puberulum	ET	17	+	+	Kidahu	-
Mangifera foetida	ET	(5)	-	-	Mangga limus tipung	found only once (plot 118)
Mangifera cf.indica	ET	(50)	-	+	Mangga	found only twice (plot 18 and 107)
Mangifera odorata	ET	5	+	+	Mangga gana-rasa	-
Semecarpus heterophylla	ET	17	+	+	Reunghas	the common 'Reunghas'of Ujung Kulon is Semecar. and not Gluta renghas
Spondias pinnata	DT	53	+	+	Kedongdong	maybe locally confused with S.dulcis; Spondias seedling were observed frequently in banteng dung.
Annonaceae						
Annona cf.muricata	ET	(66)	-	-	Nangka belanda	a few trees are growing near the watch tower at the Cijungkulon grazing ground
Desmos chinensis	BS	(51)	-	+	Hadangan	rather rare; in various vegetation types
Orophea cf. enneandra	BS	(20)	-	+	Kilja kecil (pp)	collected in plot 289, see Annonaceae rest.
Stelechocarpus burahol	ET	17	+	+	Turalak	-
Trivalvaria macrophylla	ET	(71)	-	+	Kilaja kecil (pp)	-
Uvaria cf. rufa	BL	(30)	(+)	+	Ar.kilaja (pp)	Herb.specimen from plot 99; in veg.table included in U.spec.
Uvaria spec.	BL (BS)	30	+	+	Ar.kilja (pp), Ar.perengkel (pp)	-
Annoncaceae rest	ET BS BL	-	-	+	Kilja (pp) Ar.kilja (pp)	the family of the Annonaceae is very well represented in Ujung Kulon (see e.g. Kartawinata & Apandi, 1977) However, identification of sterile specimens, esp. juvenile stages, provides serious problems in most species. Only the most characteristic species have been included in the vegetation table. The species neglected general are of little importance in the vegetation cover.
Cananga odorata	ET	53	+	+	Kenanga	-
Polyalthia Lateriflora	ET	45	+	+	Kilaja (pp)	-
Apiaceae						
Centella asiatica	BH	(68)	-	+	-	Rare; in rattan shrubland and grasslands.
Apocynaceae						
Alstonia angustiloba	ET	(11)	-	+	Lame hitam	found only once (plot 141)
Alstonia scholaris	ET	22	+	+	Lame putih	-
Alstonia spectabilis	ET	(88)	-	+	-	found only once (plot 75)

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Alyxia reinwardti	BS	(1)	-	+	-	found only once (plot 119)
Anodendron coriaceum	BL	(5)	-	+	-	found only once (plot 114)
Anodendron paniculatum	BL	88	+	+		-
Catharanthus roseus	BH	(66)	-	-		run wild near guard-post on P.Handeuleum and P.Peucang
Cerbera manghas	ET	74	+	+		-
Chonemorpha fragrans	BL	(39)	-	+		found only once (plot 173)
Ervatamia blumeana	BS	(48)	-	+		rather rare; in various types of forest
Ervatamia floribunda	BS	(51)	-	-		rather rare; mainly in rattan shrublands and forest on low altitudes
Kopsia arborea	ET	20	+	-	-	-
?Leuconotis eugenifolia	BL	7	+	+	-	-
Rauvolfia reflexa	ET	25	+	+	Melati laut (pp)	-
Araceae						
Aglaomena simplex	BH	(49)	(+)	+	?Lolo beula (pp)	collected in plot 174 & 287; in veg. table included in Arac. 'Lolo'
Alocasia indica	BH	(34)	-	+	?Kareyo biah	found only once (plot 73)
Alocasia longiloba	BH	4	+	+	Kareyo sente	-
Alocasia macrorrhiza	CA	3?	+	+	Kareyo	-
Amorphophallus variabilis	BH	11	+	+	Acung	-
Amydrium medium	BV	(49)	(+)	+	?Lolo beula (pp)	collected in plot 111; in veg.table included in Araceae 'Lolo'
Anadendrum microstachyum	BV	(49)	(+)	+	Lolo (pp)	collected in plot 26; in veg. table included in Araceae 'Lolo'
Colocasia esculenta	BH	(44)	-	-	Biah	found only once (plot 6)
Homalomena cordata	BH	49	+	+	Cariang	-
Pothos oxyphyllus	BV	9	+	+	-	-
Pothos roxburghii	BV	(49)	-	+	Ar.kigepeng	rather rare; mainly in forests
Rhaphidophora montana	BV	(49)	(+)	+	Lolo (pp)	in veg. table included in Araceae 'Lolo'
Schismatoglottis Calyptrata	BH	7	+	+	Sente	-
Scindapsus pictus	BV	2	+	+	Ar.kicorelat	-
Araliaceae						
Schefflera elliptica	BS	27	+	+	-	-
Schefflera fastigiata	SE	1	+	+	-	-
Arecaceae						Among the local people there is hardly any consensus on name for rattan species. The names provided here are common, but far from generally accepted
Areca cathecu	TP	35	+	(-)	Jambe	-
Arenga obtusifolia	TP	46	+	+	Langkap	-
Arenga pinnata	TP	52	+	(-)	Aren	-
Calamus javensis	PL	9	+	+	Rotan cacing	-
Calamus cf.orantus	PL	6	+	+	?Rotan seuti, ?Rotan bubuway	-
Calamus polystachys	PL	57	-	+	Rotan gelang	-
Calamus reinwardti	PL	(50)	-	+	-	rather rare; mainly in forest below 100 m
Calamus rhomboideus	PL	5	+	+	?Rotan leles	-
Calamus 'tunggal'	PL	10	+	(-)	Rotan tunggal	unidentified species
Calamus unifarius	PL	49	+	+	Rotan patis; Rotan walat	-

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Calamus viminalis	PL	61	+	+	Rotan korot	-
Caryota mitis	PL	49	-	(-)	Sayar	-
Ceratolobus glaucescens	PL	4	-	+	Rotan beula	-
Cocos nucifera	TP	70	+	(-)	Kelapa	-
Corypha utan	TP	57	+	(-)	Gebang	-
Daemonorops melanochaete	PL	50	+	(-)	Rotan seel	-
Daemonorops cf. ruber	PL	1	+	(-)	-	-
Korthalsia junghuhnii	PL	49	+	(-)	Rotan bulu	-
Licuala gracilis	SP	2	+	+	?Sadang gunung	-
Licuala spinosa	SP	54	+	(-)	Sa dang hutan	-
Livistona rotundifolia	TP	84	+	+	Sadang	-
Nypa fruticans	SP	88	+	(-)	Nipah	-
Oncosperma tigillaria	TP	36	+	(-)	Nibung	-
Pinanga coronata	TP	48	-	(-)	Pinang; ?Bingbin	maybe locally confused with Areca latiloba
Salacca edulis	SP	37	-	(-)	Salak	-
Aristolochiaceae						
Apama tomentosa	BH	48	+	+	Kutak	-
Asclepiadiaceae						
Calotropis gigantea	BS	63	+	+	Widuri	
Dischidia bengharensis	HE	(88)	-	+	Ar.lelentalan	founds only once (plot 228)
Finlaysonia obovata	BL	88	+	+	-	-
?Genianthus ellipticus	BL	(1)	-	+	-	found only once (plot 117)
Heterostemma acuminatum	BV	(47)	-	-	?Ar.kalameta	found only twice (plot 119 and 71)
Tylophora laevis	BV	71	+	+	Ar.ciciap (laut)	-
Asteraceae						
Ageratum conyzoides	BH	(39)	-	+	Babadotan	found only once (plot 147)
Eclipta prostrata	BH	64	+	+	Kipelik (pp)	-
Elephantopus scaber	BH	(66)	-	+	-	included in plot only once (67); also on Cigenter grazing ground
Eupatorium odoratum	BH	58	+	-	Nampong	-
Grangea maderaspatana	BH	82	+	+	-	-
Gynura cf.procumbens	BV	(39)	-	+	?Ar.balagaduk	found only once (plot 192)
Launaea sarmentosa	BH	(77)	-	+	-	found only once (plot 104)
?Microglossa pyrifolia	BS	(39)	-	+	?Ar.sintrong	found only once (plot 173) maybe confused with Blumea riparia
Mikania cordata	BV	58	+	+	Capituheur	-
Struchium sparganophorum	BH	82	+	+	Kipelik (pp), Pepelikan rawa	-
Vernonia cinerea	BH	66	+	+	-	-
Wedelia biflora	BV	(74)	-	+	Nampong laut, Tulangkotok	found only twice (plot 45 and 102)
Begoniaceae						
Begonia isoptera	BH	7	+	+	Krokot karang	-
Bignoniaceae						
Dolicandrone spathacea	DT	88	+	+	Dedelanan	-
Oroxylum indicum	ET	(49)	-	-	Compong	rather rare; mainly in shrub-and woodlands
Radermachera gigantea	ET	71	+	+	Padali	-
Bombacaceae						
Bombax valetonii	DT	19	+	(-)	Dangdeur	-
Durio zibethinus	ET	(11)	-	-	Kadu	found only once (plot 134)
Neesia altissima	ET	7	+	(-)	Bengang	-

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Boraginaceae						
Cordia dichotoma	ET	57	+	+	Kenal	
Cordia subcordata	ET	(77)		+	Kenel laut	found only twice (plot 24 and 30)
Heliotropium indicum	BH	82	+	+	Kikuntul	-
Messerschmidia argentea	BS	70	+		Babakoan (pp)	-
Tournefortia tetandra	BL	(88)	-	+	-	found only once (plot 215)
Burseraceae						
Canarium asperum	ET	(22)	(+)	+	Kenari (pp)	in veg.table included in C.spec.; sampled once (plot 86)
Canarium denticulatum	ET	(22)	(+)	+	Kenari (pp)	sampled once (plot 86) most common Canarium spec.; probably restricted to altitudes below 150 m.
Canarium hirsutum	LT	(22)	(+)	+	Kenari (pp)	in veg. table included in C.spec.; sampled twice (plot 5 and 107)
Canarium littorale	ET	(22)	(+)	+	Kenari (pp)	in veg. table included in C.spec.; sampled twice (plot 118 & 129).
Caesalpiniaceae						
Caesalpinia cf. bonduc	BL	(58)	(+)	+	Ar.jingjing kulit (pp)	collected in plot 15; in veg.table included in C.spec.
Caesalpinia cf. cinclidocarpa	BL	(58)	(+)	+	Ar.jingjing kulit (pp)	collected in plot 44; in veg.table included in C.spec.
Cassia occidentalis	BH	(66)	-	+	Kastroli	found only once (plot 331)
Cassia timoriensis	ET	(39)	-	+	Haringin	found only twice (plot 160 and 336)
Cassia tora	BH	(66)	-	+	Ketepeng	found only once (plot 331)
Cynometra ramiflora	ET	57	+	+	Kibatok	-
Peltophorum pterocarpum	ET	(71)	-	+	Jeunjing laut	rather rare; mainly in coastal vegetation
Saraca thaipingensis	ET	11	+	+	?Kimangsi	-
Tamarindus indica	ET	(66)	-	-	-	planted on P. Handeul.
Capparaceae						
Capparis micracantha	BS	31	+	+	-	-
Capparis pyrifolia	BS	14	+	+	-	-
Crateva nurvala	DT	(39)	-	+	Barunai	found only once (plot 105)
Caricaceae						
Carica papaya	PT	(44)	-	(-)	Gedang	locally cultivated near guardposts
Casuarinaceae						
Casuarina equisetifolia	AT	87	+	+	Cemara	-
Celastraceae						for Salacia see: Hippocrateaceae
Celastrus paniculatus	BL	(39)	-	+	-	found only once (plot 204)
Euonymus javanicus	ET	(26)	-	+	-	found only once (plot 310)
Microtropis elliptica	ET	1	+	+	Lameutang pasir (pp)	-
Chloranthaceae						
Chloranthus elatior	BS	(12)	-	+	-	found only once (plot 144)

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Clusiaceae						
Calophyllum grandiflorum	ET	7	+	+	Nyanyamplungang (pp)	-
Calophyllum inophyllum	ET	72	+	(-)	Nyamplung	-
Calophyllum soulattri	ET	5	-	+	Nyanyamplungan (pp)	-
Calophyllum teysmanni	ET	(9)	-	+	Nyanyamplungan (pp)	found only twice (plot 140 and 145)
Garcinia celebica	ET	22	+	+	Manggu leuweung (pp)	-
Garcinia dulcis	ET	6	+	+	Manggu leuweung (pp)	-
Garcinia lateriflora	ET	2	+	+	Manglid	-
Garcinia parvifolia	ET	16	+	+	Ceuri	-
Garcinia rostrata	ET	5	+	+	Kimenyan	-
Combretaceae						
Combretum cf. punctatum	BL	(11)	-	+	Tarawelot (pp)	found only once (plot 129)
Lumnitzera littorea	ET	(87)	(+)	+	Padi-padi (pp)	in veg.table included in L.spec.
Lumnitzera racemosa	ET	(87)	(+)	+	Padi-padi (pp)	idem
Terminalia catappa	DT	74	+	-	Ketapang	-
Commelinaceae						
Aneilema herbaceum	GH	(50)	-	+	?Bawang hutan	found only twice (plot 3 and 9)
Commelina spec.	GH	(50)	-	+	?Mumudulan	rather rare in Arenga and Dendrocnide vegetation
Murdannia nudiflora	GH	67	+	+	Kikoret	-
Compositae						see: Asteraceae
Connaraceae						
Agelaea borneensis	BL	(5)	-	+	-	found only once (plot 335, Mt. Honje)
Agelaea macrophylla	BL	(49)	-	+	Ar.kawao (pp)	collected in plot 2. Probably often confused with Connarus and Derris species ('Ar. kawao')
Connarus semidecandrus	BL	(73)	-	+	-	collected only once (plot 64), but see Agelaea macrophylla
Rourea opsis emarginata	BL	6	+	+	?Ar.dingding	-
Convolvulaceae						
Ipomoea cf.gracilis	BH	79	+	+	Mamantangan	-
Ipomoea cf.pes-caprae	BH	79	+	+	Katang-katang	-
Ipomoea cf. trifida	BV	(68)	-	+	?Ar.lolopangan rawa (pp)	found only twice (plot 95 and 96)
Lepistemon binectariferus	BV	(39)	(+)	+	Ar.lolopangan bulu;(pp);Ar. palungpung bulu (pp)	collected in plot 10 and 86 in veg.table combined with Merremia vitifolia
Merremia peltata	BV	39	+	+	Ar.palungpung (merah)	-
Merremia umbellata	BV	39	+	+	Ar.palungpung reuteun	-
Merremia vitifolia	BV	(39)	(+)	+	Ar.lolopangan bulu (pp); Ar.Palung pung bulu	collected in plot 147; in veg.table combined with Lepistemon binectariferus.
Operculina riedeliana	BV	(77)	-	+	Ar.mamantagan putih	found only once (plot 122)
Cucurbitaceae						
Benincasa hispida	BV	(51)	-	+	Ar.kunur monyet	rather rare, in var. vegetation types.

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Luffa aegyptiaca	BV	(51)	-	+	Ar.lopang monyet	collected only in plot 92; probably rather rare in various vegetation types; during fieldwork confused with Momordica charantia
Momordica charantia	BV	(51)	-	+	Ar.lopang monyet	coll. only in plot 95; see Luffa aegyptiaca
Trichosanthes bracteata	BV	(51)	-	+	?Ar.lolopangan rawa (pp) ?Ar.silayran	rather rare, mainly in shrublands, also on Pulau Peucang
Cycadaceae						
Cycas rumphii	SP	76	+	-	Pakis	-
Cyperaceae						
Carex cryptostachys	GH	(39)	-	+	Ilat huma	found only once (plot 172)
Cyperus compressus	GH	(68)	(+)	+	?Leuleuyetan piit	collected in plot 331; in veg.table included in C.spec.
Cyperus cyperinus	GH	(68)	(+)	+	-	collected in plot 146 and 334; in veg.table included in C.spec.
Cyperus halpan ssp.halpan	GH	(68)	(+)	+	Jajagoan (pp)	collected in plot 74 and 149; in veg.table included in C.spec.
Cyperus javanicus	GH	(68)	(+)	+	(Ilat)jajagoan(pp)	collected in plot 122; in veg.table included in C.spec.
Cyperus kyllingia	GH	(68)	(+)	+	Teki	by far the most common Cyperus of the area; in veg.table included in C.spec.
Cyperus pedunculatus	GH	79	+	+	Ilat laut (pp)	-
Cyperus polystachyos	GH	(68)	(+)	+	-	collected in plot 74; in veg.table included in C.spec.
Cyperus stoloniferus	GH	(68)	(+)	+	Ilat (pp)	collected in plot 36, in veg.table included in C.spec.
Cyperus cf.tenuispica	GH	(68)	(+)	+	-	collected in plot 180; in veg.table included in C.spec.
Eleocharis dulcis	GH	82	+	+	Babawangan badak	-
Eleocharis geniculata	GH	82	+	+	Babawangan ranca	-
Fimbristylis acuminata	GH	66	+	+	-	-
Fimbristylis complanata	GH	(66)	+	+	-	found only once (plot 1)
Fimbristylis cymosa	GH	79	-	+	Ilat laut (pp)	-
Fimbristylis dichotoma	GH	66	+	+	-	-
Fimbristylis miliacea	GH	69	+	+	Ilat banteng	-
Hypolythrum nemorum	GH	(49)	-	+	Harashas minyak	found only twice (plot 113 and 155)
Mapania cuspidata	GH	(5)	-	+	?Parasi pandan	found only once (plot 111)
Rhynchospora corymbosa	TG	82	+	+	Ilat (pp)	-
Scirpodendron ghaeri	PS	84	+	+	Harashas (pp)	-
Scleria spec.	GH	83	+	+	Ilat piit; ilat badak	-
Datiscaceae						
Tetrameles nudiflora	DT	(26)	-	(-)	-	only found on coastal plain of Peucang Isl. (labelled tree)

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Dilleniaceae						
Dillenia excelsa	ET	15	+	(-)	Segel	-
Dillenia indica	ET	(34)	-	-	Sempur batu	in plot 69; outside plots regularely observed in similar habitats
Dillenia obovata	DT	28	+	(-)	Sempur	-
Tetracera scandens	BL	51	+	+	Ar.kiasahan	-
Dioscoreaceae						
Dioscorea hispida	BV	40	+	+	Ar.gadung	-
Dioscorea nummularia	BV	38	+	+	Ar.huy sabut hutan; Ar. gagadungang	-
Dipterocarpaceae						
Dipterocarpus trinervis	ET	5	+	+	-	-
Ebenaceae						
Diospyros buxifolia	ET	(49)	-	+	?Pacar gunung	found only twice (plot 296 and 335)
Dipspyros cauliflora	ET	19	+	(-)	Kigentel	even very small seedlings easily recognizable by the fetid, Stachys-like smell from the inner bark
Diospyros ferrea	ET	61	+	+	Kitenyek (pp)	-
Diospyros ferrea cf. var. litorea	ET	(61)	(+)	+	Kitenyek (pp)	found only once (plot 4) in veg.table included in D.ferrea
Diospyros frutescens	ET	9	+	+	Kisiri	-
Diospyros hermaphroditica	ET	(7)	-	+	?Kinadah	found only twice (plot 129 and 140)
Diospyros cf.javanica	ET	(71)	(+)	+	Kilutung laut	possibly a form of D. maritima found only once (plot 38); in veg.table included in D.maritima
Diospyros macrophylla	ET	16	+	+	Kicalung	-
Diospyros malabarica	ET	27	+	+	Kilutung (asli) (pp)	-
Diospyros maritima	ET	71	+	+	Kilutung laut (pp)	-
Diospyros pendula	ET	71	+	+	?Kihareng gunung; ?Kilancip (pp)	a not Diospyros like species; not very common, mainly in Arenga forest, see: Drypetes ovalis
Diospyros polyathiodes	ET	29	+	+	Kilutung (pp)	-
Elaeocarpaceae						
Elaeocarpus glaber	ET	12	+	+	Katulampa	-
Elaeocarpus obtusus	ET	(12)	-	+	?Katulampa badak	found only once (plot 145)
Eriocaulaceae						
Eriocaulon truncatum	GH	(69)	-	+	-	found only once (plot 4)
Erythroxylaceae						
Erythroxylum cuneatum	ET	(20)	-	(-)	-	found only once (plot 282); tree labeled by Kostermans c.s.
Euphorbiaceae						
Alchornea javanensis	BS	(12)	-	+	Pohon singugu	found only once (plot 144)
Antidesma velutinosum	ET	6	+	+	Kiseuheur (pp)	-
Antidesma spec.	ET	71	+	+	Huni	includes both A.bunius and A.montanum
Aporosa aurita	ET	32	+	(-)	Peuris (asli)	-

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Baccaurea dulcis	ET	(47)	-	-	Menteng	rather rare; mainly in Arenga forest
Baccaurea javanica	ET	15	+	+	Kiheucit	-
Bischofia javanica	ET	33	+	+	Gadog	-
Blumeodendron tokbrai	ET	22	+	-	Jambu bol hutan (pp) Kisero	the vernacular'tokbrai' is generally used for Aglaia latifolia in Ujung Kulon
Breynia cernua	BS	(86)	(+)	+	Kipare (pp); Kipacikrak (pp)	in veg.table combined with B.racemosa
Breynia racemosa	BS	(86)	(+)	+	Kipare (pp)	in veg.table combined with B.cernu
Bridelia monoica	ET	(71)	-	+	Pohon kanyere badak/biasa	not very common; mainly in Ardisia and rattan vegetation
Bridelia stipularis	BS	61	+	+	Ar.kanyere badak	-
Claoxylon polot	ET	43	+	+	Talingkup	-
Cleisthanthus sumatranus	ET	(29)	-	+	-	found only twice (plot 97 and 171)
Croton argyratus	ET	20	+	+	Kijahe (pp)	-
Croton caudatus	BL	(39)	-	+	Ar.jalatong (pp)	found only once (plot 259)
Croton oblongus	ET	1	+	+	Kijahe gunung	-
Drypetes longifolia	ET	45	+	-	Kokosan hutan ?Kitulang gunung	-
Drypetes ovalis	ET	29	+	+	Kitulang (pp) Papancaran	most likely mista.. for Diospyros pendula by Djaja et al. (1982) see also D. serrata
Drypetes rhacodiscus	ET	9	+	+	Kibolendrang	-
Drypetes cf.serrata	ET	(26)	-	+	-	found only once (plot 310) possibly confused with D.ovalis Leaf margin possibly less diagnostic that stated in Flora of Java
Euphorbia atota	BH	79	+	+	R.ramukasang	-
Euphorbia hirta	BH	65	+	+	R.nanangkaan	-
Excoecaria agallocha	DT	(87)	-	+	Kiapu	found only once (plot 246)
Excoecaria virgata	ET	29	+	+	Kisereh	-
Galearia filliformis	ET	16	+	+	Kileho	-
Glochidion cf. kollmannianum	ET	(1)	-	+	Manggong	found only once (plot 135)
Glochidion cf. philippicum	ET	(26)	-	+	?Peuris merah	found only once (plot 28)
Glochidion rubrum	BS	(39)	-	+	?Ar.simpeureum	found only once (plot 278)
Glochidion zeylanicum	ET	60	+	+	Reu'eun	-
Glochidion spec.	ET	48	+	+	-	-
Macaranga glaberrimus	ET	(5)	-	+	?Tengek guning	found only once (plot 114)
Macaranga laevigatus	ET	(12)	-	+	-	found only once (plot 293)
Macaranga tanarius	ET	42	+	+	Mara (biasa)	-
Macaranga triloba	ET	(5)	-	+	Mara bangkong	found only once (plot 139)
Mallotus blumeanus	ET	14	+	+	Bungbulang (pp)	-
Mallotus dispar	ET	24	+	+	-	-
Mallotus floribundus	ET	(58)	-	+	Waru rot	rather rare, mainly in rattan vegetation
Mallotus mortizianus	BS	20	+	+	Bungbulang (pp)	-

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Mallotus philippensis	ET	61	+	+	Hareno laut; Daruwak laut	-
Mallotus ricinoides	ET	(30)	-	+	Calik angin	rare, in various vegetation type on low altitudes
Mallotus tiliaefolius	BS	75	+	+	Waru laut (pp)	-
Margaritaria indica	ET	(51)	-	+	?Angrit (pp)	found only twice (plot 25 and 41)
Phyllanthus hasskarlianus	BS	2	+	+	Kinereng (gunung)	-
Phyllanthus niruri	BH	(82)	-	+	-	found only once (plot 39)
Phyllanthus urinaria	BH	65	+	+	Beubounyeran	-
Ptychopyxis javanica	ET	7	+	+	Kibeusi gunung	-
Sumbaviopsis albicans	BS	12	+	+	Kijahe (pp)	-
Suregada glomerulata	ET	25	+	+	Kitulang laut; Lameutang pasir (pp)	-
Trigonostemon ovatifolius	BS	(19)	-	+	-	found only twice (plot 107 and 282); see Anacolosa (Olac.)
Flacourtiaceae						
Casearia flavovirens	ET	(71)	(+)	+	Kiseu'eur laut (pp)	collected in many localities; in veg.table included in C.spec.
Casearia grewiaefolia	ET	(71)	(+)	+	Kiseu'eur laut (pp)	collected in many localities; in veg.table included in C.spec.
Flacourtia rukam	ET	1	+	+	Rukem (pp)	-
Scolopia spinosa	ET	24	+	+	Rukem (pp)	-
Flagellariaceae						
Flagellaria indica	GV	57	+	+	Oar	
Gentianaceae						
Cotylanthera tenuis	AH	(46)	-	-	-	once found in Langkap forest on the edge of limestone plateau S. of Nyewaan.
Gesneriaceae						
Aeschynanthus radicans	HE	1	-	+	-	-
Cyrtandra cf.picta	BH	6	+	+	R.krokot	-
Cyrtandra sandei var. glabrescens	BS	(7)	-	+	Kikoyong	found only thrice (plot 138, 139 and 141)
Loxonia hirsuta	BH	11	+	+	-	-
Gnetaceae						
Gnetum gnemon	ET	24	+	(-)	Tangkil	possibly indicating former inhabitation
Gnetum latifolium	BL	(11)	+	+	Ar.kasunka (pp)	in veg.table included in Gnetum spec.
Gnetum spec.	BL	11	+	+	Ar. kasunka	Gnetum cuspidatum + G. latifolium
Gonystylaceae						
Gonystylus macrophyllus	ET	(7)	-	+	Jambu bol. hutan (pp)	found only twice (plot 118 and 141)
Goodeniaceae						
Scaevola taccada	BS	73	+	(-)	Babakoan (pp)	-
Gramineae						see Poaceae
Hernandiaceae						
Hernandia peltata	ET	74	+	(-)	Kampis	-
Hippocrateaceae						

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Loeseneriella pauciflora	BL	(51)	-	-	Ar.kijahe (pp)	rather comm., but frequently confused with Rubiaceae-climbers during fieldwork
Salacia chinensis	BL	71	+	+	Ar.kacepot A.parengkel (pp)	-
Salacia spec.	BL	(11)	-	+	-	found only once (plot 129)
Hypericaceae						
Cratoxylum cf.formosum	ET	(39)	-	+	?Pohon simperem	found only once (plot 180)
Cratoxylum sumatranum	ET	(39)	-	+	-	found only once (plot 279)
Hypoxidaceae						
Curculigo orchioides	GH	61	+	+	Parasi (pp)	possibly sometimes confused with Molineria
Molineria latifolia	GH	49	+	+	Parasi (pp)	-
Icacinaceae						
Gomphandra javanica	ET	7	+	+	-	-
Phytocrene macrophylla	BL	(58)	-	+	?Ar.kacepot bulu	found only twice (plot 203 and 219)
Lamiaceae						
Anisomeles indica	BH	(39)	-	+	-	found only once in rattan vegetation at low altitude
Hyptis rhomboidea	BH	39	-	+	Paci-paci	-
Lauraceae						
Actinodaphne glabra	ET	(46)	-	+	-	rather rare; mainly in Langkap forest
Cassytha filiformis	AV	73	+	-	-	-
Cinnamomum iners	ET	35	+	+	Kiteja	-
Connamomum sintoc	ET	2	+	+	Kiteja gn.(pp)	-
Cryptocarya densiflora	ET	5	+	+	Kiteja gn.(pp)	-
Cryptocarya ferrea	ET	24	+	+	Kilja laut (pp) Kilja putih (pp)	-
Dahaasia caesia	ET	(20)	-	(-)	-	found only once (plot 282, tree labelled by Kostermans c.s.)
Litsea roronhae	ET	36	-	+	Kibayawak	-
Lauraceae rest	ET	-	-	+	Huru, Hanjat	the family of the Lauraceae is very well represented in Ujung Kulon (see e.g. Kartawinata & Apandi, 1977). However, identification of sterile specimens, esp. juvenile stages, provides serious problems in most species. Only the most charact. spec. have been included in the vegetation table. The species neglected are all of little importance in the vegetation cover
Lecythidaceae						
Barringtonia asiatica	ET	70	+	(-)	Butum	-
Barringtonia macrocarpa	ET	15	+	(-)	Songgom	-
Barringtonia racemosa	ET	(57)	-	-	Songgom anjing	found only twice (plot 68 and 100)
Planchonia valida	ET	17	+	(-)	Putat	-
Lentibulariaceae						
Utricularia cf.gibba ssp. exoleta	BH	81	+	+	Lukut ramat	-

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Liliaceae						
Ophiopogon caulescens	GH	(39)	-	+	?Rumput babe-kungan	found only once (plot 96)
Loganiaceae						
Strychnos ignatii	BL	(5)	-	+	-	found only once (plot 335, Gn.Honje).
Strychnos villosa	BL	(50)	-	+	-	found only twice (plot 221 and 278)
Loranthaceae						
Dendrophtoe pentandra	SE	(71)	-	+	mangandeuh	rare; in var. coastal and shrubby vegetations
Lythraceae						
Lagerstroemia flos-reginae	ET	56	+	(-)	Bungur	-
Pemphis acidula	ES	75	+	(-)	Cantigi	-
Magnoliaceae						
Talauma candollii	ES	5	+	+	?Kiparay	-
Malpighiaceae						
Aspidopterys tomentosa	BL	(51)	-	+	?Ar.jajamian	rare in various vegetation types below 150 m
Malvaceae						
Hibiscus surattensis	BV	(58)	-	-	Ar. gamet	found only once within a plot (105); also com. on sandstone ridge near the Cibunar shelter
Hibiscus tiliaceus	BS	71	+	+	Waru laut (pp)	-
Sida javensis	BH	44	+	+	Lopang laut	-
Sida rhombifolia ssp.retusa	BH	67	+	-	Sidagori	-
Thespesia populnea	ET	(73)	-	+	Waru laut (pp)	with certainly found only once (plot 24). Possibly locally mistaken for Hibiscus tiliaceus.
Marantaceae						
Donax canniformis	BH	49	+	(-)	Bangban	-
Phrynium pubinerve	BH	49	+	+	Patat (incl. Patat maung)	-
Melastomaceae						
Astronia macrophylla	ET	5	+	+	?Harendong bulu	-
					?Babalimpingan	-
Medinilla radicans	BS	1	+	+	?Kiburk	-
Melastoma affine	BS	58	-	+	Harendong	-
Memecylon ambiguum	ET	31	(+)	+	?Peutag (pp)	in veg.table included in M.spec. (= M. ambiguum + M. edule + M. myrsinoides
Memecylon edule var.ovatum	ET	31	(+)	+	?Peutag (pp)	idem
Memecylon excelsum	ET	51	+	+	Hareuyhuuy (pp)	-
Memecylon floribundum	BS	31	+	+	-	-
Pternandra azurea	ET	5	+	+	-	-
Meliaceae						
Aglaia argentea	ET	24	+	(-)	Kakaduan	-
Aglaia elaeagnoidea	ET	74	+	+	Kibatok (pp)	-
Aglaia latifolia	ET	44	+	-	Tokbrai	-
Aglaia cf. odoratissima	ET	9	+	+	?Surundun (pp)	-
Aglaia/Dysoxylum spec.	ET	22	+	+	?Surundun (pp)	rest group. Strikingly well represented on Peucang Isl.(see Kartawinata & Apandi, 1977 for species list), sterile specimens of these species especially juvenile stages, are very hard to identify.

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Aphanamixis humile	ET	(22)	-	-	?Kokosan asli	found only twice (plot 27 and 335)
Chisocheton microcarpus	ET	24	+	+	-	-
Sandoricum Koetjape	ET	5	+	+	Kecapi	-
Vavaea bantamensis	ET	(12)	-	+	-	found only once (plot 145)
Menispermaceae						
Pericampylus glaucus	BV	39	+	+	Ar.geureung	
Pycnarrhena cauliflora	BS	(22)	-	+	-	rather rare; mainly on ML.Payung and Peucang
Stephania japonica var. discolor	BV	(73)	-	+	-	found only once (plot 66)
Tinomiscium phytocrenoides	BL	(73)	-	+	Ar.geureung laut	found only once (plot 40)
Tinospora glabra	BL	(51)	-	+	-	rare in various vegetation types below 150 m
Mimosaceae						
Albizia procera	ET	40	+	+	Kihiang	-
Albizia retusa	ET	(72)	-	+	Kihiang laut	found only twice (plot 242 and 248)
?Leucaena leucocephala	BS	(74)	-	+	Pohon balanding	found only once (plot 92)
Parkia roxburghii	ET	(50)	-	+	Pete hutan	included in plot only once (26);also observed in rattan vegetation
Pithecellobium clyeparia	ET	1	+	+	Phon jeunjing (gunung) (pp)	-
Pithecellobium ellipticum	BS	(50)	-	+	Pareket (pp)	rare in various vegetation types below 150 m
Molluginaceae						
Glinus oppositifolius	BH	82	+	+	Gegelangang rawa (pp)	-
Monimiaceae						
Kibara coriacea	ET	1	+	+	Kibantelik	-
Moraceae						
Artocarpus elasticus	ET	15	+	(-)	Teureup	-
Ficus altissima	SF	(18)	(+)	+	Kiara koang (pp); Kiara jingkang (pp)	collected in various localities in below 150 m; in veg.table included Ficus 'strangler'
Ficus ampelas	ET	7	+	+	Hampelas (pp)	-
Ficus annulata	SF	(18)	(+)	+	?Kiara biasa (pp)	dub. sample from plot, 173, in veg.table incl. in Ficus 'strangler';
Ficus callophylla	SF	(18)	(+)	+	Kiara biasa (pp) ?Kiara koang (pp)	deciduous in veg.table incl.in Fic.'strangl.', collected in various localities below 150 m
Ficus callosa	ET	(51)	-	+	Pangsor	not very common, mainly in Arenga forest and rattan shrubland; rarely coastal
Ficus deltoidea	SE	1	+	+	-	-
Ficus elastica	SF	(18)	(+)	+	Kiara koang (pp) Kiara jingkang (pp)	collected in plot 5, 70 and 186 in veg.table incl. in F.'strangler'
Ficus fistulosa	ET	(51)	-	+	Leles	rare in forests throughout the area
Ficus hispida	ET	(49)	-	+	?Beunying	not very comm. in forests and shrublands throughout the area
Ficus magnoliaefolia	ET	21	+	(-)	-	-
Ficus microcarpa	SF	88	+	+	Kiara biasa (pp)	-

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Ficus montana	BS	50	+	+	Amis mata	-
Ficus obscura	BT	11	+	+	-	-
Ficus pubinervis	ET	26	+	+	Hampelas (pp)	-
Ficus racemosa	DT	8	+	+	?Kitako	-
Ficus septica	ET	71	+	+	Bisoro	-
Ficus sinuata	BS	5	+	+	Pangsor gunung	-
Ficus stupenda	SF	(51)	-	+	Karet kebo	not very common in forest types below 450 m
Ficus superba	SF	(18)	(+)	+	-	collected in plot 24; in veg.table included in Ficus 'strangler'
Ficus tinctoria	SF	(49)	-	+	?Hampelas tangkal	not very common in forest and shrubland throughout the area, but not recorded on Peucang Isl.
Ficus variegata	DT	(51)	(+)	+	-	not very common in various vegetation types below 100 m, rarely coastal
Ficus cf. virens	SF	(18)	(+)	+	-	collected in veg.table in plot 186; included in Ficus 'strangler'; deciduous
Ficus spec. ('strangler')	SF	18	+	+	Kiara etc.	combination of all strangling figs, not including F.microcarpa, F. stupenda and F.tinctoria.
Maclura cochinchinensis	BL	62	+	+	Ar.kuderang	-
Parartocarpus venenosa	ET	5	+	+	Purut	-
Poikilospermum suaveolens	BL	57	+	+	Ar. leuksa	-
Streblus asper	ET	(20)	-	+	-	found only once (plot 284)
Streblus spinosus	BS	(29)	(+)	+	Jejerukan (pp)	in veg.table combined with S. taxoides
Streblus taxoides	BS	(29)	(+)	+	Jejerukan (pp)	in veg.table combined with S. spinosus
Musaceae						
Musa acuminata	TP	42	+	(-)	Pisang kole	-
Myristicaceae						
Horsfieldia glaba	ET	7	+	+	Kimokla (pp)	-
Horsfieldia irya	ET	(71)	-	+	Kelapaciung	rare, mainly in swampy areas on low altitude
Knema cinerea	ET	22	+	+	Kimokla (pp)	-
Knema intermedia	ET	(7)	-	+	?Kicarang dahan	found only twice (plot 116 and 121)
Knema laurina	ET	(46)	-	+	Kimokla (pp)	found only once (plot 326)
Myristica guatterriifolia	ET	26	+	+	Kmokla (pp)	-
Myristica iners	ET	10	+	+	Pala hutan	-
Myrsinaceae						
Aegiceras corniculatum	BS	89	+	-	Bangka kecil	-
Ardisia cf.blumii	BS	9	+	+	-	-
Ardisia crispa	BS	(10)	-	+	?Kikuya	a rare, but loyal member of soc.group 10
Ardisia cymosa	BS	12	+	+	-	-
Ardisia humilis	ET	71	-	+	Lampeni merah; lampeni hijau (pp)	-
Ardisia lanceolata	ET	45	+	+	Lampeni gunung (pp); Lampeni hijau (pp)	-
Ardisia lurida	ET	11	+	+	Lampeni gunung (pp)	-
Ardisia macrophylla	BS	5	+	+	-	-
Embelia cf. javanica	BL	(53)	(+)	+	Ar. kacembang	in veg.table included in E.spec.
Labisia pumila	BS	2	+	+	Babakoan gunung	-
Myrsine hasseltii	ET	2	+	+	?Kitengek piit, ?Harupat	-

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Myrtaceae						
Acmene acuminatissima	ET	(46)	-	+	Heas (pp)	found only once (plot 158)
Decaspermum fruticosum	ET	(71)	-	+	?Kimerak	collected only once (plot 330); possibly also in Bambusa forest
Psidium guajava	ET	(66)	-	-	Jambu piit	a few trees on Cigenter grazing ground
Rhodamnia cinerea	ET	(11)	-	+	Hareuyheuy (pp)	found only once (plot 125)
Syzygium polyanthum	ET	55	+	(-)	Salam	-
Syzygium pseudoformosum	ET	43	+	+	Kopo besar; Kopo laut	-
Syzygium cf. syzygioides	ET	2	+	+	Kopo kecil (pp)	-
Syzygium zollingerianum	ET	22	+	+	Kopo lalay	-
Syzygium spec.	ET	47	+	+	Kopo (pp) Heas (pp) Jambu hutan	rest group; the genus Syzygium is well represented in Ujung Kulon However, most species are very diffucult to identify in a sterile state.
Najadaceae						
Najas indica	CH	81	+	+	-	-
Nyctaginaceae						
Pisonia aculeata	BL	(71)	-	+	Ar. gerang	found only twice (plot 203 and 248)
Pisonia umbelliflora	ET	(26)	-	(-)	-	labeled tree along trail on Peucang Isl.
Nymphaeaceae						
Nymphaea nouchali	BH	81	-	+	?Eceng gondok	-
Olacaceae						
Anacolosa frutescens	ET	22	+	-	Kituak, Kopi leuweung	locally confused with Lepionurus (Opil.) and Trigonostemon (Euph)
Ximenia americana	BS	62	+	+	?toto'et	very variable; small seedlings may be confused with Gmelina seedlings. However Ximenia has spirally arranged leaves.
Oleaceae						
Ligustrum glomerulatum	ET	61	+	+	Ar. katumpang	-
Linociera montana	BS	5	+	+	Cangkuladuk	-
Myxopyrum nervosum	BL	52	+	+	Ar. kupa-kupa	-
Onagraceae						
Ludwigia adscendens	BH	82	+	+	-	-
Ludwigia hyssopifolia	BH	(69)	-	+	?Rumput gaga'angan	found only once (plot 74)
Opiliaceae						
Lepionurus sylvestris	ES	28	+	+	Kituak (pp)	see Anacolosa (Olacaceae)
Orchidaceae						
Nervilia spec.	BH	34	+	+	Rumput kakaloan	-
Tropidia spec.	BH	(5)	-	+	-	found only once (plot 112)
Vanilla albida	EL	(11)	-	+	Ar. panelli hutan	Found only once (plot 121)
Oxalidaceae						
Averrhoa bilimbi	ET	(22)	-	-	Bilimbing	included in plot only twice (226 and 310);

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
						also observed in higher part of Telanca massif
Palmae						see: Arecaceae
Pandanaceae						
Freycinetia cf. imbricata	GL	2	+	+	Ar. herashas	collected in plot 111; in veg.table included in F.spec.
Pandanus bidur	RT	70	+	(-)	Bidur	-
Pandanus furcatus	RS	83	+	+	Cangkuang	-
Pandanus nitidus	RS	4	+	+	Herashas (pandan); Pandan kecil	-
Pandanus tectorius	RS	77	+	(-)	Pandan (laut)	-
Papilionaceae						
Abrus fruticulosus	BL	(58)	-	+	-	found only twice (plot 4 and 58)
Alysicarpus vaginalis	BH	67	+	+	-	-
Canavalia cathartica	BV	(71)	-	+	-	not very comm.in beach-forest, rarely the interior;during fieldwork confused with Vigna mar.
Dalbergia candenatensis	BL	88	+	+	Ar. apuy rawa	-
Dalbergia pinnata	BL	30	+	+	Ar. apuy	-
Derris heterophylla	BL	88	+	+	Ar. gadel rawa	-
Derris cf. elliptica	BL	39	+	+	Ar. tualaleur	-
Desmodium laxum	BH	1	+	+	Ar. jaja'atan (pp)	-
Desmodium triflorum	BH	65	+	+	Ar. sariawan laut	Probably mistaken for D. heterocarpa by Hoogerwerf, 1970
Desmodium umbellatum	BS	75	+	+	Kanyere laut	-
Erythrina orientalis	DT	74	+	+	Dadap	-
Milletia sericea	BL	(43)	-	+	Ar. kawao (pp)	see Agelaea (Conn.)
Mucuna acuminata	BL	(77)	-	+	-	with certainly found only once (plot 32) found only once (plot 30)
Pongamia pinnata	ET	76	+	+	Malapari	-
Pueraria phaseoloides	BV	39	+	+	Ar. rarawea	-
Sophora tomentosa	BS	73	+	+	?Tarum	-
Spatholobus ferrugineus	BL	39	+	+	Ar. gongseng	-
Spatholobus littoralis	BL	(5)	-	+	-	found only once (plot 109)
Uraria lagopodioides	BH	(58)	-	+	?Sariawan kucing	In dry grass- and shrublands; rare
Vigna marina	BV	(71)	(+)	+	?Ar.kakalapaan	see Canavalia cathar.
Passifloraceae						
Adenia macrophylla var. macrophylla	BV	(58)	-	+	-	rare in shrubland; once in Bambusa forest.
Passiflora foetida	BV	(58)	-	+	Ar.pirangrung	Found only twice (plot 47 and 311)
Piperaceae						
Peperomia pellucida	BH	(58)	-	+	-	rare in rattan veg. also once in Syzygium polyanthum forest
Piper aduncum	ET	(58)	-	+	Babanyaran	like Peperomia, also rarely coastal
Piper caninum	BL	(47)	(+)	+	Ar.peupeudesan	collected in plot 70 & 117; in veg.table incl. in Piper spec.
Piper spec.	BL	47	+	+	Karu, Seuseureuhan, Etek, Ar. peupeudesan	Restground; sterile spec. are very hard to identify, esp.juvenile stages, which may deviate strongly from adult plants.

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Poaceae						
Axonopus compressus	CH	68	+	+	Jampang blasa	-
Bambusa blumeana	TB	31	-	+	Bambu haur, bambu duri	mistaken for B. arundinacrae by Djaja et al., 1982.
Centotheca lappacea	TG	(68)	(+)	+	Jampang piit (pp), Jampang kejobear (pp)	in veg.table incl. in Poaceae 'Jampang piit'
Chrysopogon aciculatus	CH	66	+	+	Dangdoman	-
Cymbogon rectus	TG	80	+	+	-	-
Cynodon dactylon	CH	79	+	+	?Jampang badak	-
Cyrtococcum accrescens	CH	(68)	(+)	+	Jampang piit (pp)	in veg.tabel incl. in Poaceae 'Jampang piit'
Cyrtococcum oxyphyllum	CH	(68)	-	+	?Jampang rawi	found only twice (plot 95 & 96, i.e. the wallow-plots in the western hills)
Dactyloctenium argyptium	CH	64	+	+	?Jampang kurite	-
Digitaria heterantha	CH	64	+	+	-	-
Dinochloa scandens	GL	38	+	+	Bambu cangkore	-
Echinochloa colonum	TG	69	+	+	Jampang ping-ping kasir (pp)	-
Gigantochloa apus	TB	(39)	-	-	Bambu apus	found only twice (plot 167 and 279; occurence probably due to former cultivation
Imperata exaltata	GH	(65)	(+)	+	Euri,alang-alang	in veg.table included in Imperata spec. (= cylindr.+ exalt.) Imperata exalt. is far more common in Java than realized by Backer & Bakhuizen van den Brink (Veldkamp, pers.comm.)
Isachne miliacea	GH	(68)	(+)	+	Jampang piit (pp)	in veg.table included in Poac. 'Jampan piit'
Ischaemum fieldingianum	CH	80	+	+	-	by Backer & Bakhuizen van de Brink incl. in I.barbatum
Ischaemum muticum	CH	78	+	+	Jampang merah	-
Leptorus repens	CH	79	+	+	Jampang laut (pp)	
Oplismenus compositus	GH	(68)	(+)	+	Jampang piit (pp)	in veg.table incl. in Poaceae 'Jampang piit'
Panicum notatum	CH	31	+	+	Rumput bambu piit, Jampang oar	resembling a miniature bambu
Panicum paludosum	GH	69	+	+	?Jampang paparean	-
Panicum repens	GH	82	+	+	Jampang jarunju	-
Panicum sarmentosum	GH	(39)	-	+	?Jampang benyer	found only once (plot 147)
Paspalum conjugatum	TG	(69)	-	+	-	found only once (plot 95)
Paspalum scorbiculatum	TG	82	+	+	?Jampang karang; ?Jampang pingping kasir (pp)	var.bispicatum
Paspalum vaginatum	TG	(77)	-	+	-	rare in various coastal vegetations both dry and humid
Sacciolepis indica	TG	66	+	+	-	rare in various veg. on low altitudes
Schizostachyum blumii	TB	(50)	-	-	Bambu bunar; ?bambu serat	formerly cultivated; does not occur spontaneously in Java
Schizostachyum zollingeri	TB	41	+	+	Bambu cangkeuteuk	-
Spinifex littoreus	TG	(79)	-	+	?Jukut kiara	found only once (plot 177)

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Thuarea involuta	GH	79	+	+	Jampang laut (pp)	-
Podocarpaceae						
Podocarpus blumei	ET	(15)	-	+	Taritik	rare in forest on Mt. Payung and western hills (on tuff soils only?)
Polygonaceae						
Polygonum barbatum	BH	82	+	+	Gunda	Probably mistaken for P.longisetum by Hoogerwerf, 19..)
Portulacaceae						
Portulaca tuberosa	BH	(79)	-	+	Gelang (pp)	found only once (plot 8)
Proteaceae						
Helicia serrata	ET	(7)	+	+	-	found only twice (plot 129 and 335)
Heliciopsis lanceolata	ET	(5)	-	+	?Bangkong	found only once (plot 110)
Rhamnaceae						
Smythea lanceolata	BL	(26)	-	+	-	found only once (plot 310)
Ziziphus horsfieldii	BL	16	+	+	Ar. kiterong	-
Ziziphus oenoplia	BL	(50)	-	+	Ar. kiterong bulu	found only twice (plot 266 and 277)
Rhizophoraceae						
Bruguiera cylindrica	ET	89	+	+	Bangka (pp)	-
Carallia brachiata	ET	(51)	-	+	Kuhkuran (pp)	not very common in various vegetations below 100 m; not coastal
Ceriops decandra	ET	89	+	+	Bangka tingi (pp) Bangka tunggul (pp)	-
Ceriops tagal	ET	90	+	+	Bangka tingi (pp) Bangka tunggul (pp)	-
Cynotroches axillaris	ET	2	+	+	Kiendog	-
Rhizophora apiculata	ET	90	+	+	Bangka (pp)	-
Rhizophora stylosa	ET	(90)	(+)	+	Bangka (pp)	in veg.table included in R.spec.
Rhizophora spec.	ET	90	+	+	Bangka (pp)	+ Rhizophora mucronata + R. stylosa
Rosaceae						
Parinari corymbosum	BT	20	+	(-)	-	-
Parinari sumatranum	BT	36	+	+	-	-
Rubus moluccanus	BL	8	+	+	Ar. hareuss	-
Rubiaceae						
Adina trichotoma	ET	(46)	-	+	-	found only twice (plot 18 and 89)
Amaracarpus pubescens	BS	(18)	-	+	-	rather rare in forest below 100 m; not coastal; not on Peucang Isl.
Anthocephalus chinensis	ET	(41)	-	(-)	Hanja	with certainty found only once (plot 260); possible sometimes confused with Nauclea
Argostemma neurocalyx	BH	(29)	-	+	-	found only once (plot 309); cremnophyte
Borreria articularis	BH	66	+	+	-	-
Borreria ocymoides	BH	66	+	+	-	-
Canthium horridum	BS	40	+	+	?Toto'et (pp)	-

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Coptophyllum fulvum	BH	(7)	-	+	-	found only twice (plot 139 and 141)
Dentella repens	CH	82	+	+	?Rumput kiralus	-
Geophila repens	BH	35	+	(-)	Mata babi	-
Guettarda speciosa	ET	72	+	+	Hamerang	-
Hedyotis auricularia	BH	(51)	-	+	?Rumput asmina	rather rare; only recorded in rattan shrubland and Syzygium polyanthum forest
Hedyotis coerulea	BH	40	+	+	-	-
Hedyotis diffusa	BH	69	+	+	Rumput kakawatan	-
Hedyotis pterida	BH	(71)	+	+	-	rather rare in various vegetations in coastal areas; also in rattan shrublands of the interior. Not on P.Peucang
Hypobathrum racemosum	ET	30	+	+	Haremang	-
Ixora grandifolia	BS	1	+	+	-	-
Ixora javanica	BS	(11)	-	+	-	found only once (plot 121)
Ixora paludosa	BS	72	+	+	Melati laut (pp)	-
Ixora salicifolia	BS	(15)	-	+	-	found only twice (plot 309 and 335)
Ixora umbellata	BS	20	+	+	-	-
Lasianthus cyanocarpus	BS	5	+	+	Kiregas bulu	-
Lasianthus hirsutus	BS	7	+	+	?Jalatong bulu	-
Lasianthus reticulatus	BS	4	+	+	Kiregas	-
Lerchea longicauda	BS	11	+	+	Reundeuh badak	-
Morinda citrifolia	ET	71	+	+	Cangkudu	-
Mussaenda frondosa	BS	(42)	-	-	-	included in plot only once (125); also found elsewhere e.g. on sandstone ridge near Cibunar
?Mycetia javanica	BS	(49)	-	+	?Kikangkareng	our own records are dubious; with certainty growing on Mt.Payung (Wirawan, coll.no.335)
Nauclea coadunata	ET	57	+	+	Gempol	-
Neonauclea calycina	ET	10	+	-	Cangcaratan	-
Ophiorrhiza cf. connescens	BH	61	+	+	Cacabean	-
Ophiorrhiza trichocarpos	BH	34	+	+	Reundeuh (pp)	-
Paederia scandens	BL	39	+	+	Ar. kipuak	-
Psychotria laxiflora	BV	5	+	+	Ar.orang aring	-
Psychotria robusta	BS	5	+	+	-	-
Randia spinosa	BS	(55)	-	+	-	found only once (plot 2)
Saprosma arboreum	ET	6	+	+	Pohon kipuak	-
Scyphiphora hydrophyllacea	BS	88	+	+	Bangka pedis	-
Uncaria cordata	BL	(39)	(+)	+	Ar. kiheulang (pp)	collected in plot 8 in veg.table combined with U.ferrea
Uncaria ferrea	BL	(39)	(+)	+	Ar. kiheulang	collected in isthmus-area
Urophyllum arboreum	BS	2	-	+	-	-
?Wendlandia glabrata	ET	14	+	+	Kicarat	-
Xanthophytum fruticulosum	BS	7	+	+	Reureundeuhan	-
Rutaceae						
Citrus cf.grandis	ET	(66)	-	-	Jeruk ?bali	a single tree on the clearing on Peucang Isl.
Glycosmis pentaphylla	BS	24	+	+	-	-
Luvunga sarmentosa	BL	11	+	+	Ar. cerukcuk	-
Micromelum minutum	ET	56	+	+	Kemaler	in some regions many seedlings can be found. trees are on the whole rather rare
Pleiospermium dubium	BS	24	+	+	Jeruk ragi	-
Zanthoxylon nitidum	BL	26	+	+	-	-
Zanthoxylum rhetsa	ET	30	+	+	-	-

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Sabiaceae						
Meliosma nitida	ET	6	+	+	Kigonyor	-
Meliosma lanceolata	ET	(5)	-	+	-	during our survey only found in plot 335 (Mt. Honje), but also known to grow in Ujung Kulon (see Appendix D)
Sapindaceae						
Allophylus cobbe	BS	71	+	+	Sampeng	-
Aphania montana	ET	(46)	-	+	Pohon kawao	found only twice (plot 26 and 35)
Dodonaea viscosa	ET	63	+	+	-	-
Erioglossum rubiginosum	ET	(49)	(+)	+	Kilalayu (pp)	collected in plot 44, 80 and 100;in veg.table included in Sapindaceae 'Kilalayu'
Harpullia arborea	ET	(49)	(+)	+	Kilalayu (pp)	collected in plot 25
Lepisanthes montana	ET	(49)	(+)	+	Kilalayu (pp)	collected in plot 9, 10, 11 and 35; in veg.table included in Sapindaceae 'Kilalayu';probably the most common 'Kilalayu' species
Mischocarpus sundaicus	BS	31	+	+	?Ar.parukpuk	-
Nephelium juglandifolium	ET	(11)	-	+	?Kibonteng	found only once (plot 129)
Pometia pinnata	ET	17	-	(-)	Leungsir	-
Xerospermum noronhianum	ET	5	+	+	?Surundun (pp)	-
Sapotaceae						
Mimusops elengi	ET	(46)	-	+	?Puperutatan	found only once (plot 87) in Java very rare wild, often planted; relict of cultivation
Palaquium ottolanderi	ET	(46)	-	+	Nanangkaän gunung	found only twice (plot 101 and 221)
Payena acuminata	ET	10	+	+	Pohon melati gunung	-
Planchonella duclitan	ET	24	+	+	-	-
Planchonella obovata	ET	4	+	+	Nanangkaän	-
Saurauiaceae						
Saurauia reinwardtiana	ET	(7)	-	+	?Kinangsi gunung	found only twice (plot 111 and 116)
Schisandraceae						
Kadsura scandens	BL	16	+	+	Ar.hunyur bu'ut	-
Scrophulariaceae						
Adenosma javanica	BH	(55)	-	+	-	found only once (plot 3)
Bacopa monnieri	BH	(82)	-	+	Gegelangang rawa (pp)	found only twice (plot 47 and 50)
Lindernia ciliata	BH	65	+	+	?Dancа laut	-
Lindernia crustacea	BH	66	+	+	?R.mata keuyeup (pp)	-
Lindernia pusilla	BH	67	+	+	?R. kokotakan	-
Lindernia ruellioides	BH	34	+	+	?R.mata keuyeup (pp); ?Antanan	-
Torenia violacea	BH	(34)	-	+	?Cacaremcan	found only once (plot 70)
Simarubaceae						
Ailanthus spec.	ET	(51)	-	+	Tuakelapa	Rather rare though out the area; not coastal. Probably mainly A.triphysa A.integrifolia is a very rare tree more or less restricted to C. &

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
						E.Java. However, it has also been recorded for Peucang Isl.(see Appendix D)
Smilacaceae						
Heterosmilax micrantha	BL	(1)	-	+	?Ar.cacanaran minyak	found only once (plot 119)
Smilax leucophylla	BL	38	+	+	Ar.canar	-
Smilax cf. zeylanica	BL	(5)	-	+	?Ar.cacinavan polos	found only once (plot 13)
Solanaceae						
Solanum melongena	BH	(68)	-	-	-	never incl. in a plot; observed on Peucang on remnant of an old guard post;on the mainland in glades,often associated with Alocasia macrorrh.
Sonneratiaceae						
Sonneratia alba	ET	89	+	(-)	Pidada	-
Sonneratia caseolaris	ET	(88)	-	+	Bogem	found only once (plot 243)
Sterculiaceae						
Heritiera javanica	ET	2	+	+	?Kiharengas	-
Heritiera littoralis	ET	86	+	-	Kokaduan laut	-
Kleinhovia hospita	ET	(58)	-	+	Tangkele	found only twice (plot 11 and 182)
Pterocymbium tinctorium	DT	30	+	+	Jongtolok	-
Pterospermum diversifolium	ET	27	+	+	Cerlang	-
Pterospermum javanicum	DT	23	+	(-)	Bayur	-
Pterygota horsfieldii	ET	21	+	(-)	-	-
Sterculia coccinea	ET	2	+	+	Hantap bu'ut	-
Sterculia foetida	DT	42	+	-	Hantap anjing	-
Sterculia macrophylla	DT	19	+	+	(Ar.jalatong or Tongtolok buluh	for juvenile stages; Muncang hutan for fullgrown trees in forest throughout the area; not coastal
Sterculia spec.	DT/ET	(51)	-	+	Hantap	mainly S.cordat and S.urceolata
Symplocaceae						
Symplocos spec.	ET	47	+	+	Peuris buluh Phohon jalatong	Both S.brandisii and S. fascicul. are recorded for Ujung Kulon. (see Appendix D)
Taccaceae						
Tacca palmata	BH	(71)	-	+	Hamperubumi	rare in Ardisia humilis and Ficus pubinervis forest
Theaceae						
Eurya acuminata	ET	2	+	+	Kuhkuran (pp)	-
Eurya cf. nitida	ET	(39)	-	+	-	found only once (plot 272)
Pyrenaria serrata	ET	36	+	-	Sariawan tangkal	juvenile specimens resemble Symplocos seedlings probably sometimes confused during fieldwork
Ternstroemia penangiana	ET	(5)	-	+	-	found only once (plot 126)

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Thymelaeaceae						
Phalerie octandra	BS	(55)	-	+	?Kililin	found only twice (plot 256 and 33.)
Tiliaceae						
Microcos tomentosa	ET	28	+	+	Daruwak	-
Pentace polyantha	ET	7	+	+	Angrit gunung	-
Triuridaceae						
Sciaphila tenella	AH	(46)	-	+	-	found only once (plot 26)
Typhaceae						
Typha angustifolia	GH	82	+	+	Walingi badak	-
Ulmaceae						
Celtis wightii	ET	(46)	-	+	?Kihu'ut (pp)	found only once (plot 101)
Celtis spec.	ET	(20)	-	(-)	-	found only once (plot 283, tree labelled by kosterman c.s.)
Urticaceae						
Dendrocnide stimulans	ET	44	+	+	Pulus	-
Pilea microphylla	BH	(66)	-	+	-	on foundation of buildings and boulders of dam through Cijungkulon mangrove
Pouzolzia zeylanica	BH	(50)	-	+	-	found only twice (plot 3 and 157)
Verbenaceae						
Avicenna alba	ET	89	+	+	Api-api	
Avicennia officinalis	ET	90	+	+	-	-
Callicarpa albida	BS	39	+	+	Phor kalumpang	-
Gmelina elliptica	BS	58	+	+	Wareng	-
Lantana camara	BS	59	+	+	Cente	-
Phyla nodiflora	BH	82	+	+	Antanan rawa	-
Premna corymbosa	ET	85	+	+	Lamentang laut	-
Stachytarpheta jamaicensis	BS	62	+	+	Jarong	-
Vitex glabrata	ET	32	+	+	Laban bihbul	-
Vitex paniculata	BS	75	+	-	Laban laut	according to Backer and Bakhuizen van den Brink (1965) this is the common coastal Vitex and not V.negundo
Vitex pubescens	ET	56	+	+	Laban biasa	-
Vitex cf. quinata	ET	(62)	-	(-)	Laban kupas	found only once (plot 43)
Violaceae						
Rinorea cymulosa	BS	20	+	+	-	-
Vitaceae						
Ampelocissus arachnoidea	BV	39	+	+	Ar. bungburutu	-
Cayratia trifolia	BV	57	+	+	Ar. kibarela rawa	-
					Ar. kibarela laut	-
Cissus diffusa	BL	47	+	+	Ar. krokot	-
Cissus discolor	BL	52	+	+	Ar. katomas	-
Leea aequata	BS	20	+	+	Sulangkar (pp)	-
Leea angulata	ET	(50)	-	+	Kitanah	not very common, mainly in forest on very low altitude (coastal plain and erosional plain along NW coast
Leea sambucina	ET	51	+	+	Sulangkar (pp)	-
Tetrastigma dichotomum	BL	(48)	-	+	Ar. kibarela (pp)	rare in Nuesia forest; also locally in shrubland on local altitude

Families and species (groups)	growth form	soc. group	in veg. table	sample	local name	miscellaneous remarks
Tetrastigma lanceaolarium	BL	51	+	+	Ar. kibarela (pp)	-
Zingiberaceae						
Amomum aculeatum	GH	4	+	+	Parahulu	-
Amomum compactum	GH	52	+	+	Kapol	when bruised strongly smelling of shoe-polish
?Amomum maximum	GH	(55)	-	+	Hangase	founds only once (plot 99)
Amomum megalochailos	GH	48	+	-	Tepus	-
Amomum spec.	GH	8	+	-	Tepus cangri	mountain species with pubescent sheath
Catimbrium malaccensis	GH	35	+	+	Laja gou	-
Costus speciosus	BH	4	+	-	Pacing	-
?Curcuma spec.	GH	(55)	-	-	Kuning	found only once (plot 2)
Globba pendula	GH	31	+	+	Lampuyang (pp)	-
Hornstedtia minor	GH	(16)	-	+	Pining	rare in forest below 150 m
?Languas galanga	GH	31	+	+	Laja biasa	-
Nicolaia spec.	GH	(39)	-	-	Honje	found only once (plot 295)
?Zingiber zerumbet	GH	(49)	-	+	Lampuyang (pp)	rare in both forest and shrubland throughout the area

APPENDIX D: Additional records of plant-species

(see section 8.2.2).

Species	Collection*	Locality and altitude
ALANGIACEAE		
Alangium salvifolium	KO 23A(1964)	Peucang Isl., Caloph.zone
ANACARDIACEAE		
Mangifera cf. odorata	KO 21850	Mt.Payung, 200 m.
Semecarpus heterophylla	KKSS 411	Peucang Isl.
ANNONACEAE		
Artabotrys suaveolens	WI 439	Peucang Isl.
Platymitra macrocarpa	SI 9988	Peucang Isl., beachforest
Saccopetalum horsfieldii	KK 55	Peucang Isl., 10 m.
Trivalvaria macrophylla	SI 10012	Peucang Isl., central hill
	SO 291	Peucang Isl., 40 m.
	KO s.n.(1964)	Peucang Isl., 5 m.
	WI 431	Peucang Isl.
Uvaria concava	SO 304	Peucang Isl.
Uvaria littoralis	WI 123	Mt.Payung 200-300 m.
Uvaria purpurea	WI 362	Peucang Isl.
APOCYNACEAE		
Microchites micrantha	KO 21845	Mt.Payung, 150 m.
ARACEAE		
Pothos roxburghii	KO 19339	isthmus
ARALIACEAE		
Schefflera elliptica	WI 353	Peucang Isl.
ARECACEAE		
Calamus javensis	UN 136	Mt.Payung 250 m.
Calamus polystachys	DR 1475	trail to Cibunar
Calamus reinwardtii	DR 1420	idem
Calamus unifarius	DR 1441/1442	Citerjun, near seashore
Calamus viminalis	DR 1442	Cibunar, seashore
Korthalsia laciniosa	DR 1424	trail to Cibunar
Livistona hasseltii	DR 1459	idem
Oncosperma tigillaria	DR 1491	behind Nypa vegetation
ASTERACEAE		
Launaea sarmentosa	HA s.n.(1823)	S.coast, sandy beach
BOMBACACEAE		
Bombax valetonii	KO s.n.(1958)	Peucang Isl., 10 m.
Neesia altissima	UN 184	Mt. Payung, 300 m.
BORAGINACEAE		
Messerschmidia argentea	SI 9997	Peucang Isl.
CAESALPINIACEAE		
Cassia javanica	UN 58	Peucang Isl., low alt.
Cassia timoriensis	KO 9990	near lighthouse
Crudia bantamensis	UN s.n.(1960)	Mt.Payung
	WI 112	Mt.Payung, 50-300 m.
	WI 346	Mt.Payung, 100-300 m.
Intsia bijuga	WI 386	Peucang Isl., 0 m.

Species	Collection*	Locality and altitude
Peltophorum pterocarpum	WI 19	Cigenter 5 m.
	SO 281	Peucang Isl., sealevel
	UN 57	Peucang Isl., low alt.
Saraca thaipingensis	WI 325	Mt.Payung, 50-100 m.
CLUSIACEAE		
Calophyllum soulattri	KO s.n.(1964)	Mt.Payung, 200 m.
Garcinia restrata	WI 98	Mt.Payung, 50-300 m.
COMBRETACEAE		
Lumnitzera littorea	KO 4013	near Handeuleum
Lumnitzera cf. littorea	KO s.n.(1964)	Peucang Isl.
Lumnitzera cf. racemosa	SO 323	Peucang Isl., swamp
CONNARECEAE		
Connarus monocarpus	KA 295	Peucang Isl., coral limestone
	KO 63A(1964)	Peucang Isl., 5 m.
Connarus semidecandrus	UN 59	Peucang Isl., low alt.
	WI 81	Mt.Payung, 50-250 m.
	WI 382	Peucang Isl., 0 m.
	WI 422	Peucang Isl.
CONVOLVULACEAE		
Ipomoea gracilis	KO s.n.(1964)	near Cape Layar
CYPERACEAE		
Fimbristylis complanata	HO 1911(1938)	grassland Cidaon
Fimbristylis cymosa	BO 1410	Peucang Isl., beach
Fimbristylis miliacea	HO 191(1938)	grassland Cidaon
DIOSCOREACEAE		
Dioscorea pentaphylla	WI 29	trail Cigenter-Jamang
DIPTEROCARPACEAE		
Vatica bantamensis	UN 120	top Mt. Payung
	WI 188, 250	Mt. Payung, 300-400 m.
EBENACEAE		
Diospyros cauliflora	KO 21818	Cape Layar
	WI 36	Cigenter
Diospyros hermaphroditica	KK 31	Peucang Isl.
Diospyros macrophylla	WI 68	Mt. Payung, 0-50 m.
	WI 432	Peucang Isl.
ELAEOCARPACEAE		
Elaeocarpus glaber	RE s.n. (1971)	Peucang Isl., low alt.
	KO 19A (1964)	Peucang Isl., 5 m.
	UN 56	Peucang Isl., near stream
Elaeocarpus obtusus	KA 299	Peucang Isl., low alt.
	KO 21835	West coast mainland
EUPHORBIACEAE		
Alchornea javanensis	KK 66	Peucang Isl., low alt.
	SO 269	Peucang Isl.
Antidesma bunius	SO 325	Peucang Isl.
	UN 47	Peucang Isl., low alt.
Antidesma ghaesembilla	KO 9987	No loc., 5 m.
Antidesma montanum	KKSS 409	Peucang Isl.

Species	Collection*	Locality and altitude
Aporosa aurita	KO 29A (1964)	Peucang Isl., 5 m.
	WI 419	Peucang Isl., 7 m.
	SO 327	Peucang Isl.
Blumeodendron tokbrai	WI 92	Mt. Payung, 50-250 m.
	UN 100	Cibunar, 5 m.
Claoxylon polot	WI 319	Mt. Payung, 100-300 m.
	UN 75	Mt. Payung, 5 m.
Cleidion spiciflorum	WI 427	Peucang Isl.
(Burm.f.) merr.	SO 274	Peucang Isl.
Croton argyratus	WI 396	Mt. Payung, 0 m.
Drypetes rhakodiskos	WI 191	Mt. Payung
	UN 114	Mt. Payung, 470 m.
Glochidion philippicum	SO 300	Peucang Isl., sea-level
Glochidion rubrum	WI 37	Cigenter, 0-5 m.
	SO 329	Peucang Isl.
Glochidion zeylanicum	HO 34 (1938)	Cikarang pasture
	WO 6	Cigenter, 0 m.
	WI 105	Mt. Payung, 50-300 m.
	UN 240	Peucang Isl., 1 m.
Macaranga glaberrima	WI 242	Mt. Payung, 300-400 m.
Macaranga javarica	WI 340	Mt. Payung, 100-300 m.
Macaranga tanarius	KK 82	Handeuleum Isl., low alt.
Macaranga triloba	UN 214	Mt. Payung, 350 m.
Mallotus dispar	SO 297	Peucang Isl.
Mallotus floribundus	SO 328	Peucang Isl.
Mallotus moritzianus	WI 402	Peucang Isl., 0 m.
	UN 226	Mt. Payung, 300 m.
Mallotus oblongifolius	WI 321	Mt. Payung, 50-100 m.
Mallotus philippensis	KO s.n. (1964)	Mt. Payung, low alt.
Mallotus ricinoides	SI 9986	Handeuleum Isl., beach forest
Margaritaria indica	KO s.n. (1964)	Peucang Isl., 20 m.
	KKSS 413	Peucang Isl.
Suregada glomerulata	KO s.n. (1964)	Mt. Payung, 20 m.
	KO 21882	Mt. Payung, 300 m.
	WI 163	Mt. Payung, 300-400 m.
	WI 197	Mt. Payung, 300-480 m.
Trigonostemon macgregorii	KK 41	Peucang Isl.
	KKSS 390	Peucang Isl.
Trigonostemon ovatifolius	DAL 183	Peucang Isl., 12 m.
	SO 296	Peucang Isl.
FLACOURTIACEAE		
Casearia flavovirens	WI 435	Peucang Isl.
	UN 48	Peucang Isl., low alt.
Flacourtia rukam	UN 104	Cibunar, 5 m.
	UN 223	Cidaon-Cape Layar, 2 m.
GNETACEAE		
Gnetum cuspidatum	KO s.n.(1963)	Peucang Isl., 20 m.
Gnetum gnemon	BO 142	Cigenter(?), low alt.
Gnetum latifolium	WI 23	Cigenter, 5 m.

Species	Collection*	Locality and altitude
GOODENIACEAE		
Scaevola taccada	VO 1573	Peucang Isl.
HERNANDIACEAE		
Hernandia peltata	VO 1383	Peucang Isl.
	DAL 194	Peucang Isl.
HIPPOCRATEACEAE		
Loesneriella pauciflora	KO 28(1964)	Peucang Isl., 5 m.
	SI 10007	Peucang Isl., centre
	WI 342	Mt.Payung, 300-400 m.
	WI 383	Peucang Isl., 0 m.
	RE 145	Peucang Isl., 0 m.
Salacia chinensis	KO 21815	near lighthouse, 0 m.
	WI 11	Cigenter, coast
HYPERICACEAE		
Cratoxylum sumatranum	KKSS 420	Peucang Isl.
	WI 371	Peucang Isl., 0 m.
	UN 19	Peucang Isl., low alt.
ICACINACEAE		
Gomphandra javanica	WI 221	Mt.Payung, 300-400 m.
Notapodytes montana	KK 53	Peucang Isl., low alt.
Stemonurus secundiflorus	RE 144	Peucang Isl., low alt.
LAURACEAE		
Actinodaphne glabra	UN 101	Cibunar, 5 m.
Beilschmidia gemmiflora	UN 6	Peucang Isl., low alt.
	UN 15	Peucang Isl., low alt.
Beilschmidia roxburghiana	KO 62A(1964)	Peucang Isl., 5 m.
	KKSS 416	Peucang Isl.
	SO 278	Peucang Isl.
	UN 31	Peucang Isl., low alt.
	UN 40	Peucang Isl., 0 m.
Cassytha filiformis	VO 1575	Peucang Isl. (on Sophora)
Cinnamomum iners	UN 90	Cibunar, 5 m.
Cinnamomum sintok	WI 150	Mt.Payung, 300-400 m.
Cryptocarya densiflora	KO 21872	Mt.Payung, 200 m.
	KO 23030	Mt.Payung, 100 m.
	WI 279	Mt.Payung, 300-400 m.
	UN 134	Mt.Payung, 250 m.
	UN 158	Mt.Payung, 300 m.
Cryptocarya nitens	KK 24	Peucang Isl., low alt.
	SI 10001	Peucang Isl.
	KKSS 397	Peucang Isl.
	RE 147	Peucang Isl., low alt.
Dehaasia caesia	KO s.n.(1960)	Peucang Isl., 15 m.
	WI 244	Mt.Payung, 300-400 m.
	WI 412	Peucang Isl., 0 m.
Litsea glutinosa	KKSS 388	Peucang Isl.
Litsea noronhae	UN 89	Cibunar, 5 m.

Species	Collection*	Locality and altitude
Notaphoebe umbelliflora	KO s.n.(1960)	Peucang Isl.
	UN 20	Peucang Isl., low alt.
	UN 46	Peucang Isl., low alt.
LECYTHIDACEAE		
Planchonia valida	WI 404	Peucang Isl., 0 m.
LOGANIACEAE		
Fagraea ceilanica	WI 434	Peucang Isl.
LORANTHACEAE		
Dendrophtoë pentandra	UN 92	Cibunar, 5 m. (on Baccaurea)
LYTHRACEAE		
Lagerstroemia flos-reginae	SI 10005	Peucang Isl., centre
	WI 389	Peucang Isl., 0 m.
	SO 287	Peucang Isl., 40 m.
	UN 71	Cibnar, 5 m.
MELASTOMACEAE		
Astronia macrophylla	WI 240	Mt.Payung, 400 m.
Melastoma affine	UN 211	Mt.Payung, 200 m.
Memecylon ambiguum	KO 26A(1964)	Peucang Isl., 5 m.
	WI 125	Mt.Payung, 200-300 m.
	WI 436	Peucang Isl.
Memecylon floribundum	KO 21861	near lighthouse, 20 m.
Memecylon myrsinoides	KKSS 418	Peucang Isl.
	UN 60	Peucang Isl., low alt.
Memecylon paniculatum	WI 304	Mt.Payung, 300-400 m.
MELIACEAE		
Aglaia argentea	KO s.n.(1958)	Peucang Isl.
	KO s.n.(1965)	Peucang Isl., low alt.
	VO 1394	Peucang Isl., low alt.
Aglaia elliptica	KO 5A(1964)	Peucang Isl., 5 m.
	KO 41A(1964)	Peucang Isl., 5 m.
	KK 33	Peucang Isl., low alt.
	WI 327	Mt.Payung, 50-100 m.
	WI 405	Peucang Isl., 0 m.
Aglaia heptandra	KO 55A	Peucang Isl., 10 m.
	KK 79	Peucang Isl., 10 m.
Aglaia latifolia	KO s.n.(1965)	Peucang Isl., 20 m.
	KK 52	near lighthouse
Aglaia odoratissima	KO 31A(1964)	Peucang Isl., 5 m.
	KO s.n.(1965)	Peucang Isl., low alt.
	WI 364	Peucang Isl., 0 m.
	WI 366	Peucang Isl., 0 m.
Dysoxylum arborescens	WI 7	Cigenter, along river
Dysoxylum caulostachyum	KK 26	Peucang Isl., low alt.
	WI 32	Cigenter-Jamang, 0-5 m.
	WI 360	Peucang Isl., 0 m.
	SO 301	Peucang Isl., sea-level
Sandoricum koetjape	UN 18	Peucang Isl., low alt.
	UN 115	Mt.Payung, 470 m.

Species	Collection*	Locality and altitude
Vavaea bantamensis	KK 75	Peucang Isl., 15 m.
	WI 365	Peucang Isl., 0 m.
	FO 39694	Peucang Isl., centre
	SO 308	Peucang Isl., sea-level
MENISPERMACEAE		
Pericampylus glaucus	UN 76	Mt.Payung, 5 m.
Tinomiscium phytocrenoides	WI 64	Mt.Payung, 0-50 m.
	WI 433	Peucang Isl.
	UN 238	Peucang Isl.
Tinospora glabra	KO 21858	near lighthouse, 20 m.
MIMOSACEAE		
Albizia retusa	KO 10A(1964)	Peucang Isl., 5 m.
Entada phaseoloides	WI s.n.(1964)	Peucang Isl.
Pithecellobium clypearia	WI 155	Mt.Payung, 300-400 m.
MORACEAE		
Ficus altissima	KO s.n.(1964)	Peucang Isl.
	UN 218	Peucang Isl., low alt.
Ficus annulata	WI 399	Peucang Isl., 0 m.
Ficus callophylla	SI 10009	Peucang Isl., centre
	SO 285	Peucang Isl., sea level
Ficus callosa	WI 442	Peucang Isl.
Ficus deltoidea	WI 248	Mt.Payung, 300-400
Ficus magnoliaefolia	KO 36A(1964)	Peucang Isl., 5 m.
Ficus montana	KO 21819	near lighthouse, 5 m.
Ficus punctata	WI 87	Mt.Payung, 50-250 m.
Ficus variegata	UN 88	Cibunar, 5 m.
Poikilospermum suaveolens	SO 318	Peucang Isl.
Streblus spinosus	KO s.n.(1964)	Peucang Isl. 20 m.
	KKSS 405	Peucang Isl.
Streblus taxoides	UN 230	Cape Layar, 50 m.
MYRISTICACEAE		
Endocomia macrocoma (Miq.) de Wilde ssp.prainii (King) de Wilde	KK 58	Peucang Isl.
Horsfieldia irya	WI 429	Peucang Isl.
	SO 279	Peucang Isl., sea-level
	UN 52	Peucang Isl., swamp.
Knema cinerea	KO s.n.(1949)	on rocks, coastal (where?), 10 m.
	KO s.n.(1950)	Peucang Isl., 15 m.
	SI 10010	Peucang Isl., centre
	KA 293	Peucang Isl. low alt.
	WI 393	Peucang Isl., 0 m.
	UN 8	Peucang Isl., low alt.
Knema globularia (Lamk.)Warb.	VO 1577	Peucang Isl. low alt.
Knema intermedia	WI 97	Mt.Payung, 50-300 m.
	UN 112	Mt.Payung, 470 m.
	UN 132	Mt.Payung, 250 m.

Species	Collection*	Locality and altitude
Myristica guatteriaefolia	KO 60A(1964)	Peucang Isl., 5 m.
	WI 374	Peucang Isl., 0 m.
MYRSINACEAE		
Ardisia lanceolata	KO 4012	Peucang Isl., 20 m.
	SI 10006	Peucang Isl., centre
Ardisia macrophylla	WI 131	Mt.Payung, 200-300 m.
Labisia pumila	KO s.n.(1964)	no locality mentioned
	WI 133	Mt.Payung, 200-300 m.
	UN 188	Mt.Payung, 300 m.
Myrsine hasseltii	WI 204	Mt.Payung, 300-480 m.
MYRTACEAE		
Acmena acuminatissima	WI 179	Mt.Payung, 300-400 m.
Decaspermum fruticosum	KO 21A(1964)	Peucang Isl., 5 m.
Rhodamnia cinerea	WI 313	Mt.Payung, 100-300 m.
Syzygium litorale	WI 20	Cigenter, 5 m.
	SO 299	Peucang Isl., 10 m.
Syzygium polyanthum	KK 69	Cidaon, low alt.
Syzygium zollingerianum	WI 31	Cigenter-Jamang, 0-5 m.
	WI 38	Peucang Isl., 0 m.
	SO 268	Peucang Isl.
NYCTAGINACEAE		
Pisonia umbelliflora	SO 275	Peucang Isl.
OLACACEAE		
Olax imbricata	SO 289	Peucang Isl., 40 m.
Strombosia javanica	UN 24	Peucang Isl., low alt.
OLEACEAE		
Linociera montana	WI 331	Mt.Payung, 50-100 m.
Myxopyrum nervosum	KA 304	low alt., no loc. mentioned
OPILIACEAE		
Lepionurus sylvestris	KO 21828	near lighthouse, 20 m.
	KO 21883	Mt.Payung, 300 m.
	WI 162	Mt.Payung, 300-400 m.
OXALIDACEAE		
Averrhoa bilimbi	WI 370	Peucang Isl., 0 m.
PANDANACEAE		
Freycinetia javanica	WI 164	Mt.Payung, 300-400 m.
Pandanus bidur	JU s.n. (Herb.LD.no.877)	beachforest (where?)
	WI 352	Cibunar
PAPILIONACEAE		
Canavalia cf. cathartica	KO s.n.(1964)	Peucang Isl., beach
Dalbergia junghuhnii	KO s.n.(1964)	Peucang Isl., 10 m.
Dalbergia pinnata	UN 28	Peucang Isl., 15 m.
Desmodium laxum	WI 114	Mt.Payung, 50-300 m.
	UN 137	Mt.Payung, 250 m.
	UN 161	Mt.Payung, 350 m.
Millettia sericea	KK 81	Peucang Isl., low alt.
Spatholobus ferrugineus	KO 49A(1964)	Peucang Isl., 5 m.
	WI 345	Mt.Peucang, 100-300 m.

Species	Collection*	Locality and altitude
PASSIFLORACEAE		
Adenia macrophylla	WI 124	Mt.Payung, 200-300 m.
PIPERACEAE		
Piper aduncum	FO 44534	Handeuleum Isl.
POACEAE		
Ischaemum fieldingianum	DAN 6434	near lighthouse
	DAN s.n. (1926)	idem
	AM 47	idem
POLYGONACEAE		
Polygonum barbatum	HO 5(1938)	Citelang, pasture
PROTEACEAE		
Heliciopsis lanceolata	WI 120	Mt.Payung, 200-300 m.
RHIZOPHORACEAE		
Carallia brachiata	UN 45	Peucang Isl., 15 m.
Gynotroches axillaris	KO 21876	Mt.Payung, 300 m.
	WI 148	Mt.Payung, 300-400 m.
	UN 184	Mt.Payung, 300 m.
ROSACEAE		
Parinari corymbosum	UN 22	Peucang Isl., low alt.
Parinari sumatranum	KO 23A(1964)	Peucang Isl., 20 m.
	KO 21855	no loc.
	KO 21859	near lighthouse, 30 m.
	WI 67	Mt.Payung, 0-50 m.
	KK 57	Peucang Isl., 15 m.
	UN 44	Peucang Isl., 15 m.
RUBIACEAE		
Borreria ocymoides	SI 10019	trail to lighthouse
Canthium dicoccum	SO 294	Peucang Isl., 40 m.
Canthium glabrum	WI 167	Mt.Payung, 300-480 m.
Cephaelis stipulacea	WI 236	Mt.Payung, 300-400 m.
Coptophyllum fulvum	WI 307	Mt.Payung, 300-400 m.
Geophila repens	UN 98	Cibunar, 5 m.
Guettarda speciosa	UN 220	Peucang Isl., seashore
Hypobathrum frutescens	KKSS 385	Peucang Isl.
	SI 9999	Peucang Isl., beachforest
Hypobathrum racemosum	SI 10014	Cijungkulon, forestedge
Ixora grandifolia	WI 255	Mt.Payung, 300-400 m.
Ixora paludosa	DAL 204	Peucang Isl., 3 m.
	KO 8A(1964?)	Peucang Isl., 5 m.
	WI 14	Cigenter, 10 m.
	WI 359	Peucang Isl.
Ixora umbellata	KO s.n.(1964)	Peucang Isl.
	KO 3A(1964)	Peucang Isl., 5 m.
	WI 86	Mt.Payung, 50-250 m.
	WI 271	Mt.Payung, 300-400 m.
	WI 390	Peucang Isl., 0 m.
Lasianthus cyanocarpus	WI 132	Mt.Payung, 200-300 m.
Lasianthus reticulatus	KO 21875	Mt.Payung, 300 m.
	UN 119	Mt.Payung, 470 m.

Species	Collection*	Locality and altitude
Lerchea longicauda	UN 39	Peucang Isl., near K.Copong
Mussaenda frondosa	WI 170	Mt.Payung, 300-480 m.
Mycetia javanica	WI 335	Mt.Payung, 400 m.
Nauclea coadunata	KK 68	Cidaon, low alt.
Psychotria laxiflora	WI 276	Mt.Payung, 300-400 m.
Saprosma arboreum	UN 160	Mt.Payung, 300 m.
	WI 149	Mt.Payung, 300-400 m.
Xanthophytum fruticulosum	WI 173	Mt.Payung, 300-480 m.
RUTACEAE		
Acronychia laurifolia	WI 102	Mt.Payung, 50-300 m.
	WI 211	Mt.Payung, 300-480 m.
	UN 148	Mt.Payung, 300 m.
Micromelum minutum	SI 10017	Cijungkulon
	WI 13	Cigenter, 10 m.
Pleiospermium dubium	KO s.n.(1964)	Peucang Isl., 20 m.
	KO 37A(1964)	Peucang Isl., 5 m.
Zanthoxylum rhetsa	UN s.n.(1960)	Peucang Isl., 10 m.
	WI 417	Peucang Isl.
SABIACEAE		
Meliosma lanceolata	UN 135	Mt.Payung, 250 m.
	WI 161	Mt.Payung, 300-400 m.
Meliosma nitida	UN 121	Mt.Payung, 470 m.
	UN 129	Mt.Payung, 200 m.
	UN 144	Mt.Payung, 200 m.
SAPINDACEAE		
Aphania montana	UN 1	Peucang Isl., low alt.
	UN 96	Cibunar, 5 m.
Harpullia cupanioides	WI 372	Peucang Isl., 0 m.
Lepisanthes montana	HO 8(1956)	Cibunar
	KO s.n.(1964)	Mt.Payung, 150 m.
	KO 21814	near lighthouse, 20 m.
	UN 69	Cibunar, 5 m.
Mischocarpus sundaicus	WI 143	Mt.Payung, 200-300 m.
	WI 308	Mt.Payung, 100-300 m.
Otophora amoena	WI 63	Mt.Payung, 50 m.
Xerospermum noronhianum	KO 21834	near lighthouse, 10 m.
SAPOTACEAE		
Planchonella duclitan	KO s.n.(1964)	Peucang Isl., coast
	KO 21832	near lighthouse, 20 m.
	WI 367	0 m.
Planchonella obovata	KKSS 415	Peucang Isl., coast
SAURAUIACEAE		
Saurauia reinwardtiana	WI 189	Mt.Payung, 300-400 m.
SCROPHULARIACEAE		
Lindernia ciliata	UN 216	Mt.Payung, coast, 4 m.
SIMARUBACEAE		
Ailanthus integrifolia	UN 200	Mt.Payung, 350 m.
	WI 264	Mt.Payung, 300-400 m.

CURRICULUM VITAE

The author was born in 1952 in The Hague, The Netherlands. After completing secondary school in 1970, he started his studies in biology at the University of Leiden. In 1979, he obtained his degree with distinction, with a specialization in plant-geography, experimental plant-taxonomy and environmental science.

From 1979 to 1981, he was employed as a junior scientist by the Centre of Environmental Studies of the University of Leiden.

From 1981 to 1983, he carried out a landscape-ecological survey in the Ujung Kulon National Park (West Java, Indonesia). The present thesis is based on the results of this survey. The fieldwork was funded by the World Wildlife Fund.

After returning to The Netherlands, he was employed for short periods by, again, the Centre for Environmental Studies in Leiden and by the Department of Vegetation Science of the Agricultural University in Wageningen.

At present, he is employed as a landscape-ecologist by the Soil Survey Institute in Wageningen.