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NOTES ON MALESIAN FABACEAE (LEGUMINOSAE–PAPILIONOIDEAE) 13. The genus Inocarpus

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SUMMARY

The genus *Inocarpus* J.R. & G. Forst. is revised. Three species are recognized of which one is new (*I. glabellus* Adema). A key to the species is provided.

Key words: *Inocarpus*, Leguminosae, Papilionoideae, Dalbergieae, Malesia, Pacific.

INTRODUCTION

Inocarpus J.R. & G. Forst. (1775) is a small genus of papilionoid legumes of the tribe Dalbergieae (Lewis et al., 2005). The genus was described earlier by Parkinson (1773) as *Aniotum-fagiferum*, which name was validated as *Aniotum* ('*Anistum*') by 'Z' (Z, 1774). The name *Inocarpus* is conserved over *Aniotum* (Greuter et al., 2000: 313). The genus is characterized by simple leaves, short inflorescences, a regular corolla, stamens adnate to the corolla tube and large orange fruits.

For a long time the genus was monotypic with as the only species *Inocarpus fagifer* (Parkinson ex Z) Fosberg (= *I. edulis* J.R. & G. Forst.). In 1950 Kostermans described a second species, *I. papuanus* Kosterm. During a course in Systematic Botany in 1978 one of our students (Lurly Nanhoe) found that the material of the latter species was mixed and proposed a new subspecies for the more glabrous specimens. My own research has shown that the material of *I. papuanus* can be divided over two taxa, indeed, and that the specimens that are different from the type of *I. papuanus* should be described as a new species (see below). The same was observed by Verdcourt (1979: 304, *Inocarpus* sp.). He, however, refrained from formally describing the new species. Already Bailey (1910) noted that the material of '*I. edulis*' (= *I. fagifer*) was mixed and gave an invalid provisional name ('*I. rubidus*': 'should it prove new when more complete specimens are available') for a specimen from Boku, British New Guinea (*Schlenker s.n.*, n.v.). According to Verdcourt (1979: 304, 305) this specimen probably belongs to his *Inocarpus* sp. and not, as proposed by Kostermans (1950), to *I. papuanus*.

Inocarpus fagifer is cultivated as a food plant (seeds are eaten) or as an ornamental and it has been suggested that the plant was carried by primeval men from W Malaysia to SE Polynesia (Guppy, 1906; Corner, 1939). Seen the widespread occurrence of the species in New Guinea and the occurrence of two other *Inocarpus* species there, it seems probable that the species is wild in New Guinea as well. Probably *I. fagifer*

has a quite wide natural distribution, especially in coastal areas, which is obscured by man-originated distribution as a cultivated plant.

Inocarpus glabellus Adema, *spec. nov.* — Fig. 1

> Folii basis (late) cuneata raro rotundata, apex acuminatus raro rotundato, pagina supre (fere) glabra, infra glabra ad tenuissime sericea. Calyx plus minusve bilabiatus. Stamina corollae tubo adnata secus 2–2.5 mm, partes liberae 2 vel 3 mm longa. Stylus ca. 4 mm longus. — Typus: *NGF 39284 (Millar)* (holo L), Papua New Guinea, Western Prov., Fly river, 100 miles from Daru.

Inocarpus rubidus F.M. Bailey (1910) 21, nom. inval.
Inocarpus sp., Verdc. (1979) 304.

Trees, rarely shrubs, 20–45 m high, dbh up to 100 cm, red sap present. *Bark* whitish to brown, longitudinally fissured, scaly. *Wood* cream to brown. *Twigs* terete, thinly strigose to glabrous, 2–7 mm diameter. *Stipules* triangular, 1–4 by 0.7–1.5 mm, caducous, outside (thinly) sericeous, glabrescent, inside glabrous. *Leaves* elliptic or ovate to obovate, 4.5–27 by 2–9 cm, index 1.8–3.3, base (broadly) cuneate, rarely rounded, apex acuminate, rarely rounded, acumen 3–24 mm long, acute to obtuse, above (almost) glabrous, below very thinly sericeous to glabrous (see note), midrib slightly raised to slightly sunken above, nerves slightly raised above, 7–15 per side, 3–20 mm apart; pulvinus 2–8 mm long. *Inflorescences* axillary, spike-like racemes or panicles, c. 10 mm long, sericeous, branches c. 7 mm long. *Bracts* to the flowers semicircular, c. 1 by 1.5 mm, outside sericeous, inside with some hairs at the base. *Calyx* c. 4 mm long, tube c. 3 mm long, ± 2-lipped, lips ± triangular, c. 1 by 1 mm; outside sericeous, inside glabrous. *Corolla* creamy or white, tube c. 2.5 mm long; lobes linear, c. 4 by 1 mm, both sides glabrous. *Stamens* 10, adnate to the corolla tube for 2–2.5 mm, filaments of epipetal ones free for 2 mm, of alternipetal ones free for 3 mm, glabrous; anthers c. 0.6 by 0.4 mm, glabrous. *Ovary* sessile, 2 mm long, sericeous; ovules 1; style 4 mm long, sericeous; stigma terminal, grooved, recurved. *Pods* discoid, 25–39 by 24–36 by 16–27 mm, valves c. 2 mm thick, very thinly sericeous, glabrescent.

Distribution — New Guinea.

Habitat & Ecology — Rain forests, swamps or river flats. Altitude up to 800 m (–1200 m, see Verdcourt, 1979). Flowering: March; fruiting: March, July to October.

Note — This new species is similar to *I. fagifer* (Fig. 2) in the indumentum of the leaves: above (almost) glabrous, below glabrous to very thinly sericeous; *I. papuanus* differs by being thinly hirsute on the lower surface of the leaves. From *I. fagifer* *I. glabellus* differs in the base of the leaves: rounded to cordate in *I. fagifer*, (broadly) cuneate, rarely rounded in *I. glabellus*; in the length of the corolla: in *I. fagifer* 12–15 mm long, in *I. glabellus* c. 6.5 mm long; in the stamens: in *I. fagifer* in two whorls, adnate to the corolla tube for 2–3 resp. 3–5 mm, in *I. glabellus* in one whorl adnate to the corolla tube for 2–2.5 mm; the free part of the filaments: in *I. fagifer* c. 0.1 mm long, in *I. glabellus* 2–3 mm long; the length of the style: in *I. fagifer* up to 0.5 mm long, in *I. glabellus* c. 4 mm long; and in the size of the fruits: in *I. fagifer* 30–65 by 45–75 by 24–38 mm, in *I. glabellus* 25–39 by 24–36 by 16–27 mm. *Inocarpus glabellus* is similar to *I. papuanus* in the smaller pods and in the stamens. From *I. papuanus* *I. glabellus* differs in the size of the stipules: in *I. glabellus* 1–4 by 0.7–1.5 mm, in

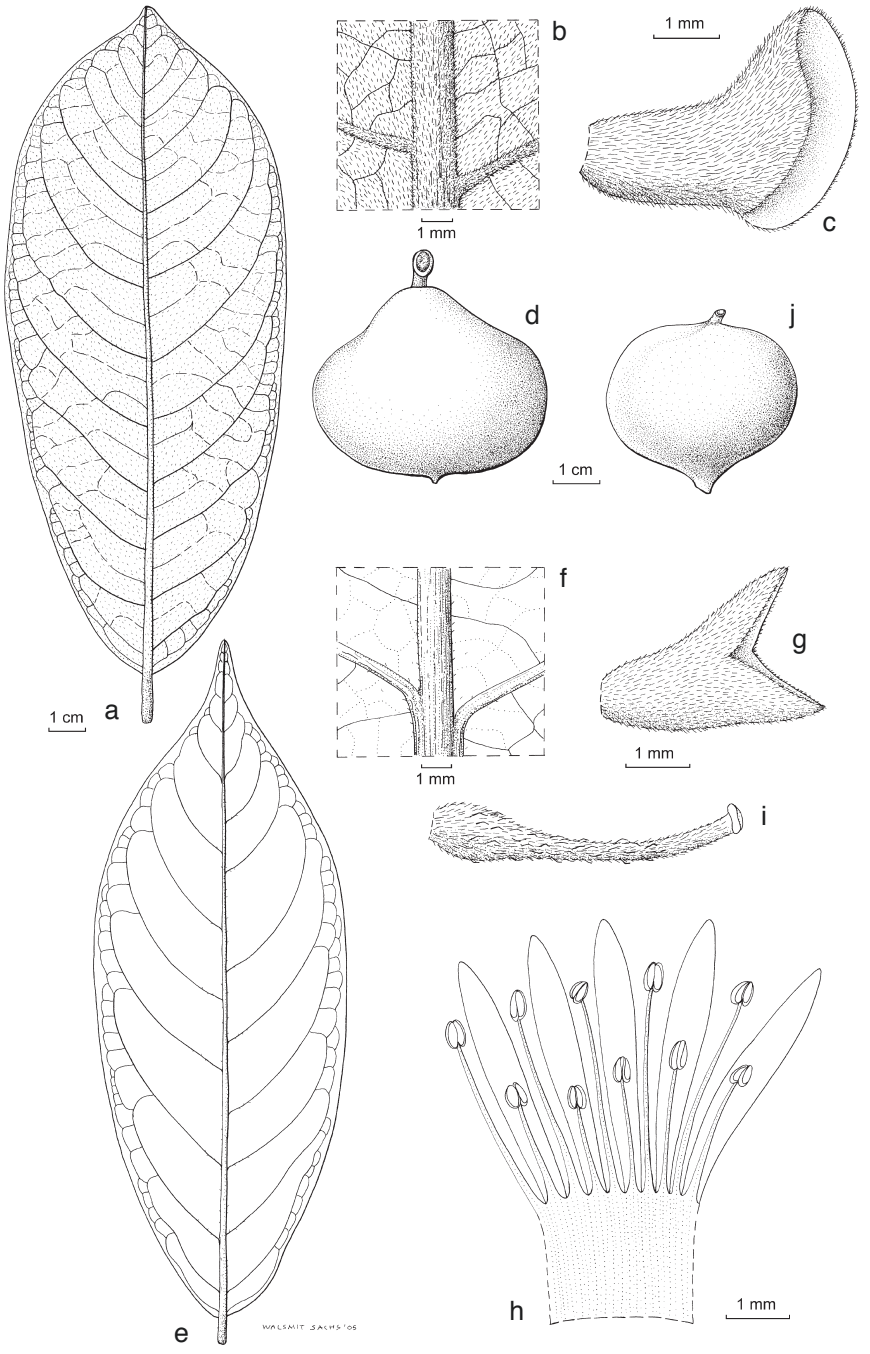

Fig. 1. a–d: *Inocarpus papuanus* Kosterm. a. Leaf; b. detail of lower surface; c. calyx; d. pod. — e–j: *Inocarpus glabellus* Adema. e. leaf; f. detail of lower surface; g. calyx; h. corolla from inside; i. pistil; j. pod (a–c: *Hort. Bog. VIII.F.69*; d: *BW 6075*; e–j: *NGF 35284*).

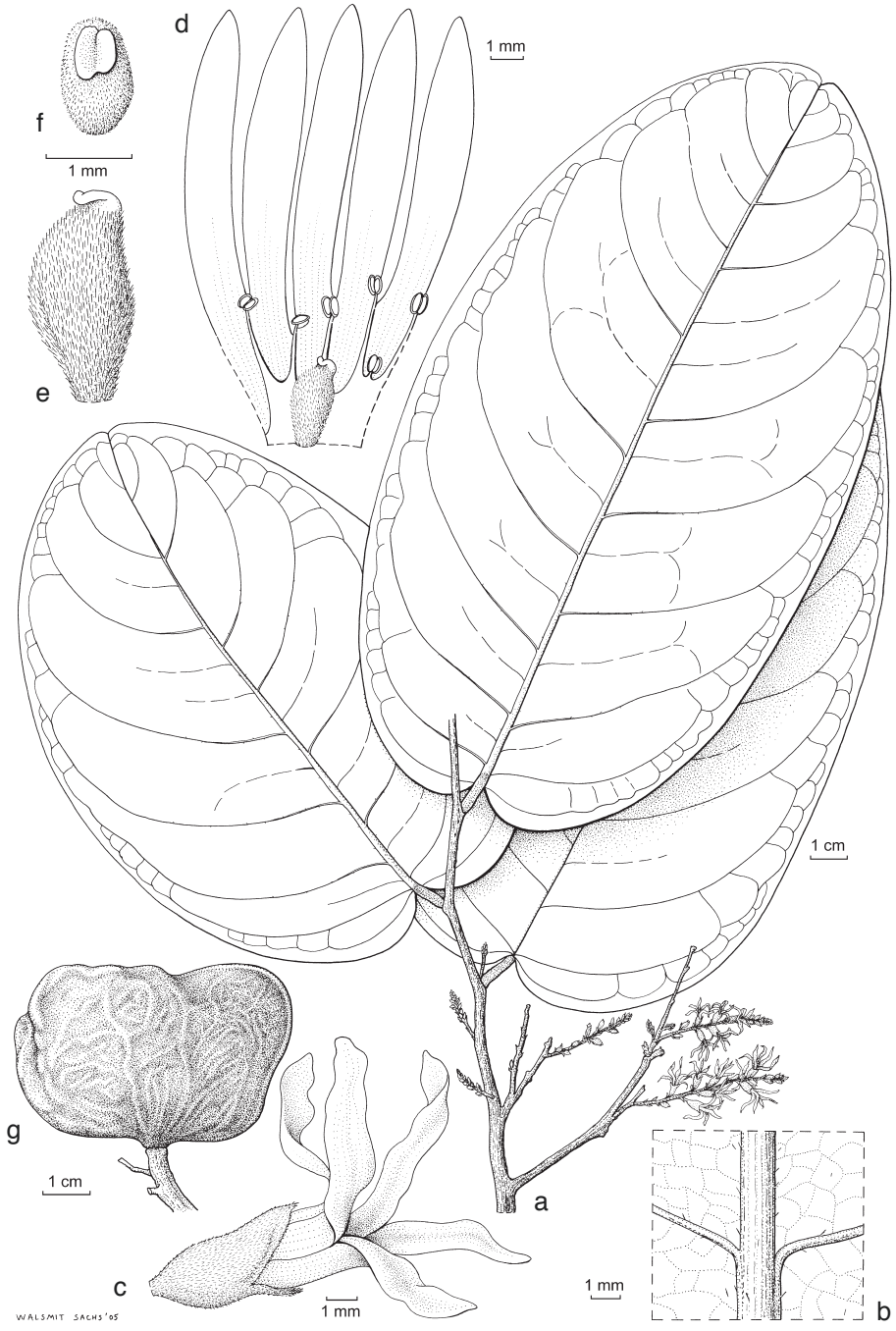

Fig. 2. *Inocarpus fagifer* (Parkinson ex Z) Fosberg. a. Habit; b. detail of lower surface of leaf; c. flower; d. corolla from inside; e. pistil; f. stigma from above; g. pod (a–f: *LAE 52198*; g: *BW 3722*).

Table 1. Differences between the species of *Inocarpus*.

	fagifer	*glabellus*	*papuanus*
Stipules	1–2 by 1–2 mm	1–4 by 0.7–1.5 mm	5–12.5 by 1.5–3.1 mm
Leaf base	rounded to cordate	broadly cuneate, rarely rounded	rounded or broadly cuneate, rarely ± cordate
apex	obtuse to rounded, emarginate, rarely acuminate	acuminate	obtuse or acuminate
lower surface	very few appressed hairs, rarely glabrous	glabrous to very thinly sericeous	thinly hirsute
Bracts	0.4–1.5 by 1–2 mm	1 by 1.5 mm	2–3.5 by 2.5–3 mm
Calyx	2-lipped 5–6 mm long	2-lipped c. 4 mm long	spathaceous 5–6.5 mm long
Corolla	12–15 mm long	c. 6.5 mm long	8–11 mm long
Stamens	2 whorls	1 whorl	1 whorl
adnate to corolla tube for	3–5 resp. 2–3 mm	2–2.5 mm	3–5 mm
free part of filaments	c. 0.1 mm long	2–3 mm long	1–2 resp. 3–4 mm long
Style	up to 0.5 mm long	c. 4 mm long	c. 5 mm long
Pods	30–65 by 45–75 by 24–38 mm	25–39 by 24–36 by 16–27 mm	29–43 by 31–50 by 20–28 mm

I. papuanus 5–8(–12.5) by 1.5–3.1 mm; in the indumentum of the leaves (see above); in the size of the bracts: in *I. glabellus* 1 by 1.5 mm, in *I. papuanus* 2–3.5 by 2.5–3 mm; in the calyx: in *I. glabellus* ± 2-lipped, in *I. papuanus* spathaceous; and in the length of the corolla: in *I. glabellus* c. 6.5 mm, in *I. papuanus* 8–11 mm. See also Table 1.

Further notes — The indumentum of the leaves is almost totally absent or absent. If hairs are present on the upper surface only very few appressed hairs are found, on the lower surface usually more (to very thinly sericeous) hairs are found. As the hairs are scattered and appressed the overall impression is of glabrous leaves. Sometimes the apices of the leaves seem to be rounded; however, in all these cases the leaves probably have been damaged in one way or other. The bracts are ± curved and together with the inflorescence axis they form a cup. *NGF 22449 (Gillison)* has cauline brachyblasts with short flowering twigs (some leaves and inflorescences).

KEY TO THE SPECIES OF INOCARPUS

1a. Stipules 1–4 mm long. Lower surface of leaves glabrous to very thinly sericeous. Bracts to the flowers 0.4–1.5 by 1–2 mm. Calyx ± 2-lipped 2

b. Stipules 5–8(–12.5) mm long. Lower surface of leaves thinly hirsute. Bracts to the flowers 2–3.5 by 2.5–3 mm. Calyx spathaceous. — Corolla 8–11 mm long. Stamens ± in 1 whorl . . . . . **I. papuanus**

2a. Leaf base rounded to cordate, apex obtuse to rounded, emarginate, rarely acuminate. Calyx 5–6 mm long. Corolla 12–15 mm long. Stamens in 2 whorls, free part of filaments c. 0.1 mm long. Style up to 0.5 mm long. Pods 30–65 by 40–76 by 24–38 mm . . . . . **I. fagifer**

b. Leaf base (broadly) cuneate, rarely rounded, apex acuminate. Calyx c. 4 mm long. Corolla c. 6.5 mm long. Stamens ± in 1 whorl, free part of filaments 2–3 mm long. Style c. 4 mm long. Pods 25–39 by 24–36 by 16–27 mm . . . . . **I. glabellus**

ACKNOWLEDGEMENTS

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IDENTIFICATION LIST

1 = *I. fagifer*; 2 = *I. glabellus*; 3 = *I. papuanus*

Aet & Idjan 788: 1; 823: 2 — Ambriansyah AA 836: 1; 2308: 1 — Anderson 3124: 1 — Andrews 28: 1 — Atasrip 153: 1 — Atjeh 6: 1.

Baker 1149: 1 — Bakhuizen van den Brink f. 3607: 1 — bb Ja 2105: 1; 4991: 1; 13453: 1; 21472: 1; 23210: 1; 24255: 1; 25301: 1; 25400: 1; 27291: 1; 28853: 1; 28932: 3; 29783: 1; 31123 (NIFS): 1; 31325 (NIFS): 1; 32663 (NIFS): 1; 32929 (Lundquist): 1; 33268 (Soehanda-Ilham): 1; 33294 (Kostermans): 3; 33380 (Kostermans): 1; 33442 (Kostermans): 3; 33460 (Kostermans): 3; 33646 (Kostermans): 1 — Bernardi 13064: 1 — BNBFD 2733 (Goklin): 1 — Branderhorst 225: 1 — Brass 2834: 1; 3078: 1; 3292: 1; 8129: 1; 8360: 1; 22069: 1; 25865: 1 — Bristol 2239: 1 — BSIP 46 (White): 1; 1669 (Whitmore): 1; 3528 (Lipaqeto): 1; 4060 (Whitmore): 1; 4870 (Teona): 1; 5942 (Kere): 1; 6433 (Maenu'u): 1; 6518 (Inimua): 1; 8077 (Nakisi): 1; 9019 (Boraule et al.): 1; 9415 (Gafui et al.): 1; 9651 (Sirute'e et al.): 1; 10052 (Sirute'e et al.): 1; 10368 (Runikera et al.): 1; 10640 (Runikera et al.): 1; 10809 (Gafui et al.): 1; 11056 (Gafui et al.): 1; 11793 (Mauriasi et al.): 1; 12359 (Fa'arodo et al.): 1; 12585 (Runikera et al.): 1; 13625 (Mauriasi): 1; 13712 (Fa'arodo et al.): 1; 14410 (Mauriasi et al.): 1; 15653 (Mauriasi et al.): 1; 15728 (Mauriasi et al.): 1; 17142 (Mauriasi et al.): 1; 18083 (Mauriasi et al.): 1; 18651 (Gafui et al.): 1 — BW 493 (Schram): 3; 520 (Schram): 3; 838 (Brouwer): 1; 1249 (Koster): 1; 1275 (Koster): 1; 1309 (Koster): 1; 1322

(Koster): 1; 1387 (Koster): 1; 1404 (Koster): 1; 1490 (Koster): 1; 1943 (Schram): 3; 2151 (Mangold): 1; 2152 (Mangold): 1; 2153 (Mangold): 1; 2503 (Brouwer): 1; 2854 (Schram): 3; 3246 (Nautje): 1; 3722 (Kalkman): 1; 3788 (Kalkman): 1; 4254 (Koster): 1; 4413 (Koster): 1; 4612 (Versteegh): 1; 5166 (Moll): 3; 5357 (Van der Leden): 1; 5625 (Iwanggin): 3; 5656 (Iwanggin): 1; 5744 (Iwanggin): 1; 6075 (Schram): 3; 6295 (Kalkman): 1; 6689 (Moll): 3; 6825 (Koster): 1; 6933 (Koster): 3; 6947 (Koster): 3; 6948 (Koster): 1; 6988 (Koster): 3; 7055 (Koster): 1; 7259 (Lorenzo): 3; 9419 (Schram): 1; 9444 (Schram): 1; 9888 (Moll): 1; 10115 (Iwanggin): 1; 10195 (Iwanggin): 1; 10883 (Koster): 3; 10907 (Koster): 1; 11142 (Koster): 3; 11561 (Moll): 1; 11932 (Koster): 1; 12313 (Schram): 1; 12382 (Schram): 1; 14901 (Schram): 1; 15047 (Schram): 1; 15580 (Kokkelink): 3.

Corner 28640: 1; 34704: 1 — Craven & Schodde 795: 1.

De Vogel 4483: 1 — Docters van Leeuwen 9703: 2 — Dorgelo 1596: 1.

Elbert 2769: 1.

Forbes 816: 1 — Friedberg 509: 1.

Hartley 12288: 2 — Haviland & Hose 3486: 1 — Hellwig 20: 1; 205: 1 — Hoogland 4197: 1; 4748: 1; 4861: 1 — Hort. Bog. VIII.F.69: 3.

Idjan & Mochtar 326: 1.

Jaag 1315: 1 — Junghuhn 87: 1.

Kajewski 2641: 1 — Koorders 4124: 1; 4125: 1; 4127: 1; 24854: 1; 28983: 1; 33731: 1; 38853: 1; 39327: 1 39486: 1 — Kornassi 968: 1 — Kostermans 498: 1; 10793: 1 — Kuswata & Soepadmo 4: 1; 144: 1.

LAE 52158 (Foreman): 1; 52198 (Foreman): 1; 59046 (Isles & Vinas): 1; 61289 (Croft et al.): 1; 61316 (Croft & Vinas): 1; 72334 (Wiakabu & Umba): 2; 73485 (Wiakabu et al.): 1; 77562 (Kerenga et al.): 1 — Lam 2876: 1.

Meijer 8012: 1; 43375: 1 — Mitchell 189: 1 — Mondi 56: 1 — Moore 224: 1.

NGF 168 (Haas): 1; 1363 (Smith): 1; 1818 (Mair): 1; 3783 (Womersley): 1; 11521 (Henty): 1; 14845 (Henty): 1; 14845A (Henty): 1; 17265 (Kairo): 2; 22265 (Gillison): 2; 22449 (Gillison): 2; 22454 (Gillison): 1; 26682 (Frodin): 1; 30400 (Ridsdale): 1; 35284 (Millar): 2; 37152 (Womersley): 2; 39287 (Streimann & Kairo): 1; 41209 (Womersley): 1; 41221 (Womersley): 1; 43854 (Womersley & Katik): 2; 46790 (Katik & Steven): 2; 48233 (Foreman & Kumul): 2; 48358 (Foreman & Kumul): 1.

Powell 500: 1 — Pullen 1191: 1 — Purwingsih & Sanusi 77: 1.

Rau 374: 1; 630: 1 — Robinson 540: 1 — Rutten 1854: 3; 1887: 1.

S 6942 (Brunig): 1; 33639 (Dawos): 1 — SAN 122739 (Meijer): 1 — Sands et al. 6246: 3 — Satake & Niimura 931: 1 — Saunders 966: 1 — Schmutz 2398: 1 — SF 34704 (Corner): 1 — Sieber (Fl. Maurit. II) 361: 1 — A.C. Smith 6601: 1; 9686: 1 — St. John 14511: 1 — St. John & Fosberg 15853: 1 — Stone 2265: 1 — Sykes 170444: 1.

Takamatsu 767: 1 — Takeuchi 11083: 2; 11139: 2 — Takeuchi & Ama 16367: 2 — Teijsmann 13623: 1; 13850: 1; 13874: 1.

Van Balgooy 1737: 1 — Van Borssum Waalkes 3207: 1 — Van Ooststroom 12896: 1 — Van Steenis 18135: 1 — Verheijen 5412: 1.

Waterhouse 620B: 1 — Widjaja 6124: 1.

REVIEWS

DAVID GLENNY & BILL MALCOLM: **Key to Australasian Liverwort & Hornwort Genera.** Australian Biological Resources Study (ABRS), Canberra, and University of Queensland, St. Lucia, Australia, 2005. ISBN 0-642-56840-5 (CD-ROM). Price: USD 75.

David Glenny, specialised in the systematics of New Zealand liverworts and flowering plants, and Bill Malcolm, well-known for his beautiful and comprehensive bryophyte illustrations and glossary, combined their knowledge to produce this attractive, generously illustrated key for determining Australasian liverwort and hornwort genera. It provides all the benefits of a multiple entry interactive key, such as allowing the user to start the identification at any point, with characters of his/her own choice. Photographs or drawings as well as additional information about the respective genera can be consulted during the identification process. To choose characters effectively, 'best character' options and comparisons of (dis-)similarities of the remaining genera are implemented. Of course, at least some knowledge about bryophyte characters is still necessary, but this key clearly facilitates identification of liverwort and hornwort genera in the Australasian region. The CD is thus a good buy and a model for further similar products.

Running the program, which comes with the Lucid Player software, requires installation under Windows® and the presence of a web browser (Internet Explorer 5 or Mozilla). The user interface is straightforward after about 10 minutes of exploration, and a short tutorial can be employed as well. I found only few technical details a little bit unhandy, for example the scroll bar to enlarge the photographs showing the character states is not clearly marked. The key together with the illustrations, notes, most of the relevant literature up to the publication date, and a glossary, make this CD in fact a kind of real liverwort and hornwort flora at the generic level. One would wish that a similar key for determinations down to the species level would follow soon.

MICHAEL STECH

EDNA GRANÉLI & JEFFERSON T. TURNER (eds.): **Ecology of Harmful Algae**. Ecological Studies 189, Springer Verlag, Berlin, Heidelberg, New York, 2006. 439 pp., 45 figures, 15 tabs. ISBN 978-3-540-32209-2. Price: EUR 129.95 (net price); USD 169; GBP 100.

Being persuaded to write this review because an editor of Blumea stated that "this profound study of nuisance algae will certainly contain chapters on invading macroalgae and their harm as well as about green and brown tides", I soon detected that this recommendation was not correct at all. Nothing about invading macroalgae, nor about toxic ones or those that form part of green and brown tides. Oh, certainly, there are data on brown tides (many references), but all to brown tides caused by microalgae, not about those of Ectocarpoid Phaeophycean macroalgae. No, this is a book about harmful microalgae – especially about harmful phycoplankton. I would expect to see that in the title of such a publication. Thus this is about the evil guys of phycology, the algae that make a bad reputation for the organisms of the different photosynthetic groups of microorganisms. These harmful algae, especially when forming water blooms, can

cause adverse effects like beach fouling, oxygen depletion, reduced water quality, bad smell, clogging of fish gills. Several of these organisms can be severely toxic.

Clearly being a macroalgae specialist, I was nevertheless attracted by the present publication, because it provides a thorough overview of its field, which was rather unknown to me. It contains no less than 30 chapters written by a team of 54 specialists, publishing about organisms (with some rather unknown ones like the brown Pelagophyceae), global distribution, ecology, physiology, food web connections, mitigation, human activities and even economic impacts, all related to these harmful microalgae. Not only to the really harmful ones, however: the nitrogen-fixing cyanobacteria in the genus *Trichodesmium* are quite often mentioned, and occurrence of members of that genus is in most cases not directly related to nuisance notions. However, indirectly these nitrogen-fixators may enrich the waters where they occur in such a way that bloom-forming cyanobacteria get their chance to expansion. These and other toxin-producing microalgae can cause fish kills and shellfish poisoning, being expressed in paralytic shellfish poisoning (PSP), diarrhetic shellfish poisoning (DSP), amnestic shellfish poisoning (ASP) and neurotoxic shellfish poisoning (NSP), which may result in shellfish intoxication and human fatalities. Other terrors are ciguatera fish poisoning and finfish and their eggs being directly attacked by predating Dinophyceae, like *Pfiesteria* and *Ichthyodinium* species. The latter name cannot be traced via the index, the former can.

Because of the impact of harmful algal blooms on human welfare, economic effects of these blooms are currently studied from different angles. Main interest here is to design responses to these blooms that could mitigate economic losses at an appropriate and cost-minimizing scale. See how distinctions are drawn between scientific and economic approaches to these problems. It is good to survey different realms here. Recommended!

WILLEM F. PRUD'HOMME VAN REINE

P.M. MCCARTHY & A.E. ORCHARD (eds.): **Algae of Australia. Introduction**. ABRS, Canberra; CSIRO Publishing, Melbourne, 2007. Hardback, 744 pages, many colour photographs. ISBN 978-0-643-09377-5. Price: AUD 180.

This stout and attractive book is not only an introduction. It has a number of the most beautiful colour photographs, mainly on marine macroalgae from an earlier published book 'Marine plants of Australia' by J.M. Huisman. Moreover, 35 co-authors have been working to prepare 48 chapters as well as a glossary of more than 1500 technical terms. The first few chapters are about the history of systematic phycology in Australia and about phylogeny, classification, the fossil record and identification of algae. Every chapter has an own list of references, but there is also an elaborate bibliography of Australian algae (41 pages), which is systematically arranged according to subject (general texts, floras and field guides, checklists, as well as lists on taxonomic groups). These first chapters are followed by those dealing with what is called 'the major groups of algae'. There are 29 of such divisions and classes discussed in this introductory book. There is a considerable, but not complete match between the classification used for the paragraphs dealing with taxonomic groups in the bibliography and that of the chapters on the major groups of algae. The lists of references in the bibliography and these chapters, however, show very little overlap amongst each other. That is economical in

a way, but to get a more complete list of references, one has to check two separate lists in the same book. For the heterotrophic taxa there is a paragraph in the bibliography, but not a chapter under 'major groups of algae'. Maybe this is because not everyone will accept these heterotrophic organisms as belonging to the algae. Following the more taxonomical/morphological chapters are those on different aspects of ecology. Quite understandable marine and non-marine environments are separated. There are also chapters on microalgae and on macroalgae, but the latter is only for the marine representatives. Ecology of non-marine algae is habitat directed: streams, lakes and large rivers as well as wetlands get their own chapters, as do terrestrial habitats. Ecology is followed by biogeography. Now the marine macroalgae get special chapters on biogeographical provinces, while the biogeography of marine microalgae, as well as of the freshwater microalgae and non-marine macroalgae each can be surveyed in their separate undivided chapters. It attracts attention that, while the temperate southern coast of continental Australia form the rich Flindersian biogeographical province for marine macroalgae, there is not such a biogeographical province for the marine microalgae in front of these southern coasts.

Before the elaborate glossary of 62 pages, there is a thorough chapter on economic importance of algae. I was, however, a bit disappointed to miss a connection between economic importance of algae in Australia and in neighbouring South East Asia. New Zealand seems to get generally more attention – maybe that bias can be discussed or removed in the separate parts of the series 'Algae of Australia'.

The solid introductory book of the series cause high hopes in relation to the following volumes. It does not only hold out a good prospect of accurate recording of interesting phycological work, but it is also useable as an up-to-date textbook and handbook for modern phycology in general. Institutes and university laboratories interested in biodiversity of plants or in research related to the tree of life need to have this book on their shelves.

WILLEM F. PRUD'HOMME VAN REINE

JOHN M. HUISMAN: **Algae of Australia. Nemaliales.** ABRS, Canberra; CSIRO Publishing, Melbourne, 2006. 164 pp., 51 figures, 23 colour plates. ISBN 0-643-09378-8. Price: AUD 90.

TIMOTHY J. ENTWISLE, STEPHEN SKINNER, SIMON H. LEWIS & HELEN J. FOARD: **Algae of Australia. Batrachospermales, Thoreales, Oedogoniales and Zygnemaceae.** ABRS, Canberra; CSIRO Publishing, Melbourne, 2007. 200 pp., 45 figures. ISBN 978-0-643-09431-4. Price: AUD 90.

Phycologists in most countries and continents can be jealous because of the new series 'Algae of Australia'. Two issues have been published recently and both are extremely well-prepared books. The one on the red algae order Nemaliales has a refined dark-red cover, the one on a number of freshwater algae (Batrachospermales and Thoreales in the red algae; Oedogoniales and Zygnemaceae in the green algae) has an equally refined green cover. The reviewer does not yet understand what the meaning of these colours is. Earlier he has reviewed another volume in this series, simply named 'Introduction' (see above). There the cover is mainly black. All covers have beautiful colour photographs of algae.

Both new volumes have descriptions of the orders together with keys to the families. These are followed by descriptions of the families, keys to the genera, and the same for genera and species occurring in Australia. There are 55 small maps about the distribution of Australian species of Nemaliales and no less than 210 comparable maps for the freshwater algae. A comparison of both sets of maps shows clearly that marine macroalgae in Australia have been collected much more frequently than the freshwater macroalgae. For each species or separate infraspecific taxon there is a distribution map and a figure (usually more). The latter are photographs or line drawings and for some Nemaliales also colour plates. Apart from similarities there are some differences between the two volumes: In the Nemaliales book the bibliographic lists are less elaborated than in the freshwater volume, but in the former there is a separate list of references marked as 'Bibliography'. The chapters on several of the freshwater genera or families have lists of doubtful, excluded and/or rejected names. These designations are only used in relation to occurrence in Australia, thus do not include taxonomic decisions. The book on Nemaliales starts with an introduction about the order, including a very useful discussion on diagnostic characters and on specimen preparation for microscopical examination. Further on one finds appendices on typification of Harvey specimens, on recognition of the new genus *Titanophycus* and on the *Dichotomaria marginata* assemblage, including some new combinations. In both books there is a glossary and a paragraph on abbreviations and contractions. The notions in the glossaries are for the greater part selected from the elaborate glossary that can be found in the introductory volume of the series. Only few specialized definitions are added. For abbreviations and contractions there is also a list in the introductory volume, and this list has been amply used. Nevertheless, I cannot find an explanation for the words 'vide' and 'fide', nor do I understand why in the Nemaliales book one finds abbreviations like cv = cultivar, dbh = diameter at breast height and both IPL and PPL, thus inner and primary peristomial layer.

Marvellous books have been published so far in this series – I am looking forward to see more of these. Don't miss the pleasure!

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JOHN M. HUISMAN, ISABELLA A. ABBOTT & CELIA M. SMITH: **Hawaiian Reef Plants.** University of Hawaii Sea Grant College Program, Honolulu, Hawaii, 2007. 264 pp., many coloured photographs. ISBN 1-929054-04-01. Price: USD 29.95 (inside US and territories); USD 34.95 (international, postage included).

Between the popular colour plate marine guides the special books on marine plants are thriving. Recent new ones are for the Tanzanian (Oliveira et al., 2005), Kwazulu-Natal (De Clerck et al., 2005), European coasts (Cabioc'h et al., 2006) and Palau (Ohba et al., 2007). The three authors of Hawaiian Reef Plants are well-known marine botanists who have selected beautiful photographs to show the biodiversity. In this kind of books the introductory chapters are often very interesting and these are as diverse as the marine floras themselves. About Hawaiian reef plants we are informed through paragraphs on the identity and nomenclature of marine plants, completed by several taxonomic keys. Also included are paragraphs in which the selection of the plants is explained as well as preparation of herbarium sheets and data on the Hawaiian shoreline and coastal reef ecosystems with their shortage of native grazers and excess of alien invasive species.

The book is thought to be an easy-to-use-guide in a form that is accessible to all. For that purpose a glossary is included to help understand the scholarly text. Nevertheless, some questions may arise about some statements. Some examples: On p. 11, below the photographs of *Gracilaria coronopifolia* is stated: "The lower specimen is bearing reproductive structures; it is illegal to collect such plants, which produce spores that become the next generation". It is not clear, however, on what regulation this is based and that regulation is not further explained or stipulated. Maybe it is related to the Hawaiian notion of 'Limu', the traditional use of marine plants for food and ceremonies. Over-exploitation by Limu-pickers may have brought the need for such regulations. On p. 18 it is stated that "There are fewer species and less diversity on shores where there is a large tidal range, whereas in places with a small tidal range like Hawaii, marine plants and animals characteristically arrange themselves to take advantage of conditions of wetness and light". The suggested contrast is not explained here and the general rule suggested is certainly not a global rule – in many areas of the world larger tidal ranges means more different niches and consequently more diversity and more different species. The introductory paragraphs stress the importance of grazers to keep coastal areas (and especially coral reefs) free of covering algae. It is stated that the Hawaiian reefs have not enough fishes to graze the bloom of the alien species, such as *Gracilaria salicornia, Eucheuma denticulatum, Kappaphycus alvarezii, Hypnea musciformis* and even the relatively well-grazed *Acanthophora spicifera*. Even the green *Avrainvillea amadelpha* is considered to be an alien species in Hawaiian waters.

Reading through the pages with data and photographs on the different marine plants a few inconsistencies were met, like the statement (on p. 30) that *Jania adhaerens* is the most common species of its genus, but in the special part only two other *Jania* species are dealt with. On p. 113 *Gracilaria tikvahiae* is listed as one of the popular Hawaiian food sources. It is not told, however, where that red seaweed grows (not in Hawaii?!). The small photograph of *Spyridia filamentosa*, which is correct on p. 132, has again be printed on p. 149 as *Spirocladia hodgsoniae*. On the photographs of *Caulerpa serrulata* and *Caulerpa webbiana,* these species are not well characterized, and the photograph of the propagule of *Sphacelaria novae-hollandiae* shows such a structure of *Sphacelaria tribuloides*. Finally, I do not understand the numerical data on *Sargassum* ("six species in Hawaii are fortunately only five recorded species"?).

For visitors, especially marine phycologists and all others interested in marine plants of the Indo-West Pacific this book is a good companion during fieldtrips and coastal research. It will be a necessary addition to libraries and reference collections in this area, as well as in the libraries of botanical and marine-biological institutes.

References:

Cabioc'h, J., J.-Y. Floc'h, A. Le Toquin, C.-F. Boudouresque, A. Meinesz & M. Verlaque. 2006. Guide des algues des mers d'Europe. Second edition. Delachaux & Niestlé SA, Paris, France.

De Clerck, O., J.J. Bolton, R.J. Anderson & E. Coppejans. 2005. Guide to the seaweeds of Kwazulu-Natal. Scripta Bot. Belg. 33. National Botanic Garden of Belgium, Meise, Belgium.

Ohba, H., S. Victor, Y. Golbuu & H. Yukihira. 2007. Tropical marine plants of Palau. Palau International Coral Reef Center, Koror, Palau.

Oliveira, E.C., K. Österlund & M.S.P. Mtolera. 2005. Marine plants of Tanzania. Botany Department, Stockholm University, Sweden.

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