

Studies on tiger beetles. LXXXIV. Additions to the tiger beetle fauna of Sulawesi, Indonesia (Coleoptera: Cicindelidae)

F. Cassola

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Zool. Med. Leiden 70 (9), 31.vii.1996: 145-153, figs 1-2.— ISSN 0024-0672.

Dr Fabio Cassola, Via F.Tomassucci 12/20, I-00144 Roma, Italy.

Key words: Cicindelidae; Sulawesi; new data; new species.

Distributional new data are provided for several interesting or poorly known tiger beetle species from Sulawesi, Indonesia. The generic attribution of *Wallacedela brendelli* Cassola, 1991, is confirmed, and moreover two new species, *Wallacedela? problematica* spec. nov. and *Wallacedela butonensis* spec. nov., are described respectively from the environs of Majene, W coast of SW Sulawesi, and from Buton Island, SE Sulawesi.

Introduction

Since my revision of the tiger beetles of Sulawesi, Indonesia (Cassola, 1991), several interesting new data have been accumulated from several different sources, including the discovery of two additional new species, which all are the subject of the present paper. Additional specimens from previously known localities, on the contrary, are not included. The specimens studied have been deposited in the following collections: Instituut voor Taxonomische Zoologie (ITZ), Amsterdam, Netherlands; Nationaal Natuurhistorisch Museum (RMNH), Leiden, Netherlands; Mr Hirofumi Sawada (HS), Aomori, Japan; Mr Charles Dheurle (CD), Langres, France; Mr Jiri Moravec (JM), Adamov u Brna, Czech Republic; author's collection (FC).

Best thanks are due to Dr J.P. Duffels (Amsterdam, Netherlands), and Mr Jan Krikken (Leiden, Netherlands), who collected most of the specimens studied and kindly submitted them for identification.

Material

Therates bipunctatus Wiesner, 1988

Material.— Sulawesi Tenggara. 1 ♂ + 1 ♀ (ITZ), Centipede Camp, c. 3°49'S-121°40'E, nr Gn. Watuwila, NE of Kolaka, 1100 m, 1-2.xi.1989, J.P. Duffels (canopy, undisturbed hilly rainforest, at light).

Note.— Previously known from Sulawesi Tengah and Sulawesi Selatan only (Cassola, 1991).

Therates flavilabris (Fabricius, 1801)

Material.— Sulawesi Tengah. 1 ♀ (ITZ), Totop Camp along Batui River, 1°09'S-122°31'30"E, SW of Luwuk, 120 m, 19.x.1989, J.P. Duffels (lowland rainforest).

Note.— A poorly known species, only recently resuscitated by Wiesner (1988) from synonymy with *T. fasciatus* (Fabricius, 1801).

Cylindera (Ifasina) discreta discreta (Schaum, 1863)

Material.— **Sulawesi Selatan.** 1 ♂ (ITZ), Soroako, Mining area, PT Inco. Forest remnant, 20.x.1993, 660 m, ultrabasic soil, 2°33'30"S-121°21'15"E, at light, J.P. & M.J. Duffels. **Sulawesi Tenggara.** 1 ♀ (ITZ), Mokowu Camp along Mokowu River, c. 3°49'S-121°40'E, nr Gn. Watuwila, NE of Kolaka, 200 m, 30.x.1989, J.P. Duffels (disturbed lowland rainforest).

Note.— The nominate race of this species is a Sulawesi endemic (Cassola, 1991). The species as a whole appears to be in need of a taxonomic revision.

Lophyridia decemguttata (Fabricius, 1801)

Material.— **Sulawesi Selatan.** 1 ♀ (ITZ), E side of Lake Matana, Kg Salura, Nightjar Camp, 520 m, 15.x.1993, J.P. & M.I. Duffels.

Note.— This species apparently is in need of a taxonomic revision, based on a large amount of material from all the various areas of its apparently wide geographical range. May be several different new species or subspecies are involved (Acciavatti, pers. comm., 1992).

Lophyra (Spilodia) striolata (Illiger, 1800)

Material.— **Sulawesi Selatan.** 1 ♀ (ITZ), E side Lake Matana, Kg Salura, Nightjar Camp, 520 m, 2°32'15"S-121°28'00"E, 13.x.1993, J.P. & M.I. Duffels (secondary growth along rainforest at PT Inco road, at light); 1 ♀ (ITZ), Soroako, gardens, 18-20.x.1993, M.I. & J.P. Duffels.

Note.— The subspecific attribution of Sulawesi populations still needs to be properly ascertained.

Thopectica (s.s.) *diana* (Thomson, 1859)

Material.— **Sulawesi Selatan.** 3 ♂♂ (ITZ), 1 ♂ (FC), Onan, Sg. Parabaya, 58 km N of Majene, 19.xi.1993, J.P. & M.I. Duffels (strongly disturbed rain forest).

Note.— The four specimens examined have the head and the pronotum metallic cupric red with some greenish reflections. The overall impression is that this species, as it is presently conceived (Cassola, 1991), needs to be revised. May be several different species or subspecies are involved.

Thopectica (s.s.) *sawadai* Cassola, 1991

Material.— **Sulawesi Selatan.** 1 ♂ + 1 ♀ (CD), Palopo, x.1993.

Note.— This species was recorded so far from Sulawesi Tengah only (Palu and

Lore Lindu National Park areas), while from the Palopo area a different relative species, *T. bugis* Cassola, 1991, was known. Mislabelling cannot be excluded.

Thopeutica (s.s.)? *allardiana* Cassola, 1991

Material.— **Sulawesi Selatan.** 1 ♀ (ITZ), c. 30 km NE of Enrekang, Gn. Rantemario, Gowa Camp 1800 m, 3°24'45"S-120°00'00"E, 9.xi.1993, J.P. & M.I. Duffels (undisturbed lower montane forest along Sg. Gowa Sarumpapa); 1 ♀ (FC), Palopo, x.1993.

Note.— This interesting species was described based on a single female specimen from Puncak, Palopo, Sulawesi Selatan (in FC collection). Unfortunately, the two additional specimens mentioned above are both females again. Therefore, due to lack of male specimens, the attribution of this species to the genus *Thopeutica*, although most probably correct, is still tentative. It must be emphasized that the specimen from Enrekang is considerably larger than the other two (length: 16 mm, without labrum, instead of 12 mm).

Thopeutica (s.s.) *vantoli* Cassola, 1991

Material.— **Sulawesi Selatan.** 1 ♂ (CD), Palopo, v.1992.

Note.— This species was previously known from Sulawesi Tengah only (Palu and Lore Lindu N.P. areas). If some mislabelling is not involved, this new record would extend the species' range to Sulawesi Selatan as well.

Thopeutica (*Pseudotherates*) *guttula guttula* (Fabricius, 1801)

Material.— **Sulawesi Tenggara.** 1 ♀ (RMNH), Kolaka, Sanggona Base Camp, 200 m, 14-21.x.1989, J. Krikken & K. van der Blom (second-growth forest, top, combi-trap); 1 ♂ (ITZ), Mokowu Camp along Mokowu River, nr Gn. Watuwila, NE of Kolaka, c. 3°49'S-121°40'E, 200 m, 31.x.1989, J.P. Duffels (disturbed rainforest along stream, at light).

Note.— In addition to the single female specimen studied elsewhere (Cassola, 1991), two further specimens, including a male, were found by J.P. Duffels and J. Krikken from the Kolaka region. The male aedeagus showed to be very similar in shape to that of *T. (P.) punctipennis* (Jordan, 1894) (Cassola, 1991, fig. 22 a').

Wallacedela eximia (van der Linden, 1829)

Material.— **Ambon.** 1 ♂ (FC), 1 ♀ (RMNH), ex coll. Jekel/A.E. Kerkhoven (doubtful record?).

Note.— This species, which was designated to be the type species of the genus *Wallacedela* Cassola, 1991, was originally described by van der Linden (1829), in a paper dealing with the fauna of Java and neighbouring islands, as coming from the Aru Islands ("des îles Arou"), south of present-day Irian Jaya (New Guinea). The type locality was therefore considered to be doubtful or incorrect (Cassola, 1991). The puzzling discovery of two old specimens, labelled as coming from Amboina (pre-

sent-day Ambon Island, South Moluccas), may also be due to mislabelling, since the whole genus *Wallacedela* is known so far to be endemic to Sulawesi only.

Wallacedela krikkeni Cassola, 1991

Material.— Sulawesi Selatan. 1 ♂ (RMNH), 1 ♂ (FC), Rantepao area, 900 m, Todjambu, 14-20.vi.1992, M.A. Lieftinck.

Note.— This species was already known from a different locality of the same area (Puncak near Palopo).

Wallacedela? problematica spec. nov.
(fig. 1a-c)

Material.— Holotype, ♀ (ITZ). Sulawesi Selatan: Onan, Sg. Parabaya, 58 km N of Majene, strongly disturbed rain forest, 19.xi.1993, J.P. & M.I. Duffels.

Diagnosis.— A small *Wallacedela*-like species, superficially similar to a small *Thopetica diana* (Thomson, 1859) as to the body colour and the elytral markings, however, easily recognizable by the almost square more parallel-sided pronotum and the deeply foveated female coupling sulci in the upper part of the mesepisternum. Male unknown.

Description.— Head dark bronze with some metallic reflections, roseate above, bluish-violet behind, cupric red on cheeks, clypeus and above the insertion of the antennae; glabrous, only two long sensorial setae near both eyes. Surface of eyes and cheeks distinctly striate, more finely of frons, the striae being slightly waved behind on neck. Labrum testaceous, with a very slight metallic cupreous lustre on its disc; transverse, subrectangular in shape, approximately three times wider than long, very slightly tri-dentate in front, with 16 long setae near forward edge and more sparsely setose on disc. Mandibles testaceous, apical and inner teeth slightly rufescent; labial and maxillary palpi testaceous, with the tip of last segment dark metallic. Antennae rather short, reaching approximately the first third of the elytral length; scape and articles 2-4 testaceous, bare, antennomeres 5-11 rufous-brown, the last four progressively darkened, nearly blackened, towards the apex, finely and evenly pubescent.

Thorax: pronotum subsquared, slightly longer than wide, bare and smooth, metallic cupric red, with posterior tubercles distinctly developed. Proepisternum dark bronze with some bluish reflections, mostly bare, with some very fine white erect pubescence in lower parts near the coxae; mesepisternum shining black, with a deep fovea in upper half close to mesepimeral rim (female coupling sulci); metepisternum metallic red, bare, with just a few small setae on extreme hind corners. Lower half of mesepimeron, sides of sternum and coxae rather strongly setose.

Elytra wider than head (including eyes), slightly rounded at sides, dull black with 5 yellow elytral spots (humeral, subhumeral, marginal, discal and subapical spots) and moreover a small but distinct apical lunule situated in a larger rufous apical area which links it to the subapical spot. Apical angle evenly rounded, conspicuously retracted near the suture, the sutural tooth very small, nearly lacking. Epipleuron mostly testaceous.

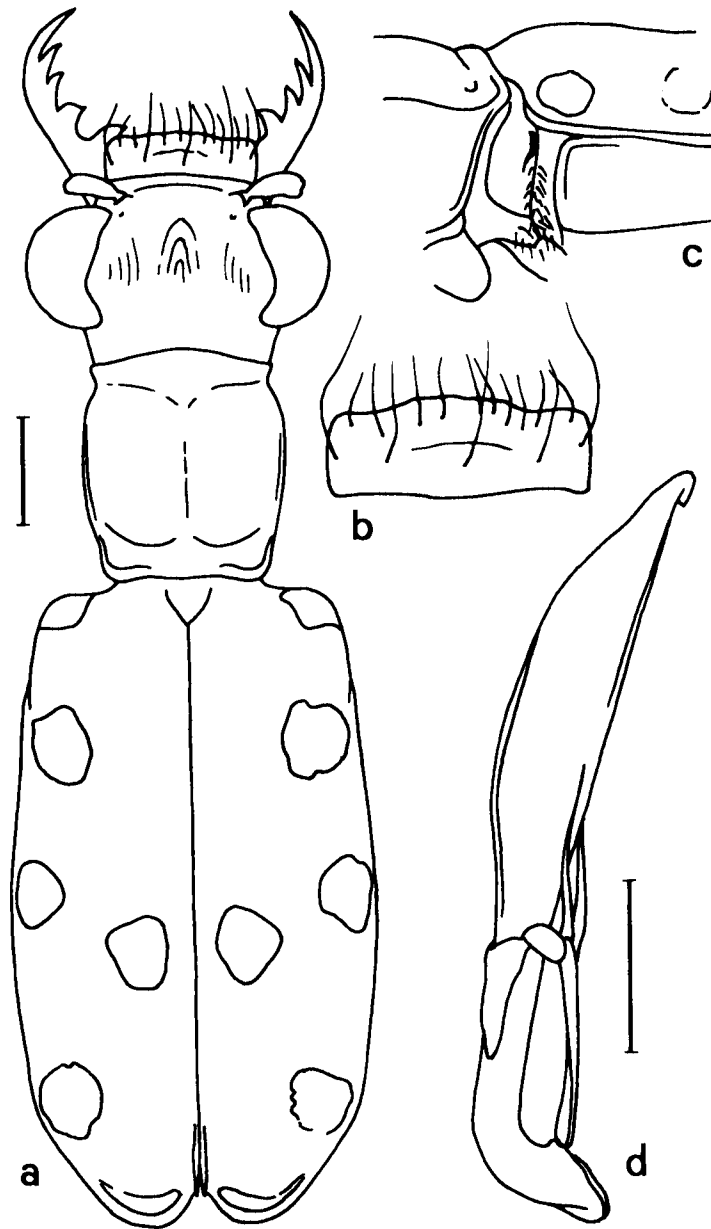


Fig. 1a-c. *Wallacedela? problematica* spec. nov., holotype, ♀; a, habitus; b, labrum; c, coupling sulci; 1d, *Wallacedela brendelli* Cassola, 1991, ♂ from Palolo, Palu, aedeagus. Scale-lines: 1 mm.

Abdominal sternites finely and sparsely pubescent, with some longer sensorial setae near the middle; the first three sternites dark, nearly black, with cupreous reflections at sides, the other ones rufous, with some slight metallic lustre. Legs and trochanters nearly completely testaceous red, only tarsal segments shortly darkened apically.

Male unknown.

Length: 9.8 mm (without labrum).

Etymology.— This puzzling new species has been named in consideration of its uncertain generic attribution.

Remarks.— The attribution of *W. problematica* spec. nov. to the genus *Wallacedela* (*eximia* group) is just a hypothetical, tentative one, due to lack of male specimens. However, this generic attribution seems to be highly probable, due to its general facies, the shape of pronotum and the deep female coupling sulci. Concerning the body colour and the elytral markings, the new species strongly reminds of a small *Thopeutica diana* (Thomson, 1859), however, clearly differing for the above mentioned characters. Neither *Wallacedela* nor *Thopeutica* species were known so far from the Majene peninsula in SW Sulawesi. Due to the strong biodiversity of Sulawesi (Cassola, 1991), the discovery of a new species from such an area is not surprising.

Wallacedela butonensis spec. nov.
(fig. 2)

Material.— Holotype, ♂ (FC). Sulawesi Tenggara: Buton (= Butung) Island, Wakarumba, 3-7.ii.1994, M. Strba & I. Jenis. Paratypes (2 ♂♂ + 3 ♀♀): topotypic (FC, JM, RMNH).

Diagnosis.— A *Wallacedela* species of the *eximia* group, with labrum, mandibles, appendages and abdominal sternites rufous-testaceous. Head and pronotum shining black, elytra dull black with the rufous-testaceous colouration extending to the basal and apical areas, the lateral margins and the whole suture; elytral markings include a transverse, straight middle band. Female mesepisternal coupling sulcus a deep furrow just above the middle. Male aedeagus long, slender, with a straight, slightly button-ended apex.

Description.— Head shiny, black with some violet reflections on vertex and eyes, metallic green on cheeks, behind the eyes and near base of antennae; surface glabrous (with just two long sensorial setae near both eyes), distinctly striated on eyes and cheeks, more finely on frons and vertex. Labrum testaceous, transverse, subrectangular in shape, approximately 2.5 times wider than long, with a very small tooth in the middle; 10-12 long setae near forward edge (the two middle ones placed more on disc). Mandibles testaceous, slightly darkened on teeth; labial and maxillary palpi testaceous. Antennae rather short, reaching approximately the anterior fourth of the elytral length; scape, articles 2-4 and base of fifth joint rufous-testaceous, bare, antennomeres 5-11 black, finely and evenly pubescent.

Thorax: pronotum shining black, bare and smooth, approximately as long as wide, slightly constricted in front and behind, rather convex on disc. Proepisternum black with some bluish reflections, hind margins bluish-green; surface bare, with just a few white erect setae in lower front part near coxae. Meso- and metepisterna blackish-violet, bare, with just a few white setae on extreme hind corners; mesepimeron

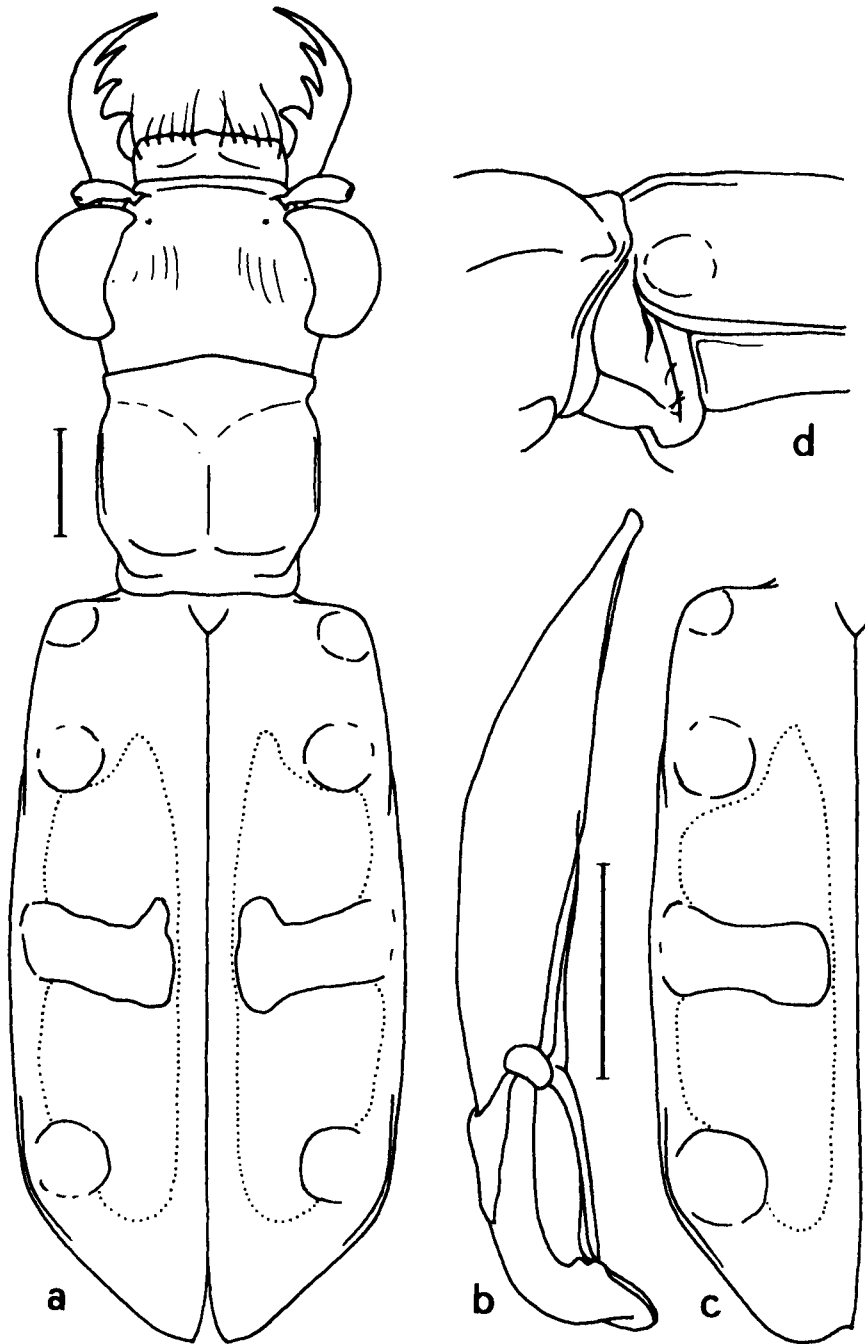


Fig. 2a-b. *Wallacedela butonensis* spec. nov., holotype, ♂; a, habitus; b, aedeagus; 2c-d, id., paratype, ♀; c, left elytron; d, coupling sulci. Scale-lines: 1 mm.

metallic green, with white erect setae on lower half. Female coupling sulcus a deep furrow above the middle, just below the line of epipleuron.

Elytra wider than head with eyes, subparallel-sided; ground colour dull black with a rufous-testaceous colouration on the whole basal and apical areas, on lateral margins and along the suture. Elytral markings comprising a humeral lunule (almost disappearing within the rufous colouration of the basal part), a transverse, almost straight middle band, and a subapical spot (also almost disappearing within the rufous colouration of the apical part). Apical angle slightly emarginate in females, with a small but obvious sutural spine (nearly lacking in males). Epipleuron rufous-testaceous.

Abdominal sternites rufous-testaceous, very finely and sparsely pubescent on disc, with 2-4 longer sensorial setae near the hind edges. Trochanters and legs wholly rufous-testaceous, slightly darkened apically on tarsal segments.

Male aedeagus long, slender, with a straight, slightly button-ended apex. Inner sac typical of the genus, devoid of a flagellum.

Length: 11-11.6 mm (without labrum).

Etymology.— This interesting new species has been named after the collecting site, the Island of Buton in SE Sulawesi.

Remarks.— *W. butonensis* spec. nov. clearly belongs to the same group of species as *W. eximia* (van der Linden, 1829). However, it is clearly distinguishable by the straight, transverse middle band and by the invasive rufous-testaceous colouration which leaves just two dull black areas on the disc, above and behind the middle band. No other *Wallacedela* species were known so far from the islands south of the eastern peninsula of Sulawesi Tenggara, the geographically nearest species being *W. brendelli* Cassola, 1991 (see below). Taking in consideration the strong biodiversity of Sulawesi (Cassola, 1991), the discovery of a new species from such an area does not surprise at all. May be other new species will follow when this region will be fully explored.

Wallacedela brendelli Cassola, 1991
(fig. 1d)

Material.— Sulawesi Tengah. 1 ♀ (FC), Palolo, Palu, vi.1991; 22 ex. (HS), 3 ♂♂ + 1 ♀ (FC, RMNH), Palolo, Palu, vii.1991; 1 ♂ (FC), Palolo, Palu, ix.1991.

Note.— This species was described based on three female specimens from Lore Lindu N.P., Sulawesi Tengah (Cassola, 1991). A female non-type specimen from Gn. Watuwila, NE of Kolaka, Sulawesi Tenggara, was also attributed to it. Due to lack of male specimens the species' attribution to genus *Wallacedela* was considered so far to be hypothetical and tentative only.

The welcomed discovery of several other specimens, including males, from a different but not too distant locality, some 70 km NNW of Lore Lindu N.P., confirms my previous taxonomic placement of *W. brendelli* in the genus *Wallacedela*. The male aedeagus appears to be similar to that of *W. storki* Cassola, 1991, being long, straight, slightly tapering dorsally, with a small ventral hook apically.

Four puzzling specimens (3 males and 1 female) appear to have, unlike the others, the legs, the articles 1-4 of the antennae and the apex of elytra rufous-testaceous,

and moreover their labrum is partially tinged with testaceous. They all are provisionally attributed to *W. brendelli* as well, however, more material is needed for better understanding of the intraspecific variation. If this statement will prove to be correct, the species will appear to be somewhat intermediate between the group of *W. eximia* (van der Linden, 1829) and that of *W. tambusisii* (Kibby, 1985).

Wallacedela storki Cassola, 1991

Material.— Sulawesi Utara. 1 ♂ (RMNH), Celebes, Soemalatta [= Sumalata, N coast, 80 km NW of Gorontalo], ii, Rosenberg; 1 ♂ (FC), Kwadang [= Kuandang, 40 km NNW of Gorontalo], x, Rosenberg.

Note.— This species was described from the Dumoga-Bone National Park, east of Gorontalo. The new collection sites extend the species' range just a bit westwards.

Wallacedela glorioparadoxa (Horn, 1914)

Material.— Sulawesi Selatan. 2 ♀♀ (ITZ), Batas, 68 km N of Wotu along Trans-Sulawesi Highway, 1200 m, 23.x.1993, J.P. & M.I. Duffels (primary rainforest along road, at light).

Note.— This beautiful species was known so far from Sulawesi Tengah (Toli-toli, Palolo and Lore Lindu N.P.) only.

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Received: 23.ii.1996

Accepted: 28.iii.1996

Edited: C. van Achterberg