

## Chapter 6

# *Proboscidoplocia* (Ephemeroptera, Polymitarcyidae) from the Réserve Naturelle Intégrale d'Andohahela and Surrounding Areas, With a Description of a New Species

Jean-Marc Elouard,<sup>1</sup> Michel Sartori,<sup>2</sup> Jean-Luc Gattolliat,<sup>2</sup> and  
Ranalison Oliarinony<sup>1</sup>

### Abstract

A new species of *Proboscidoplocia* is described from the Réserve Naturelle Intégrale d'Andohahela, Madagascar. Two other species in the same genus, *P. vayssierei* and *P. ruffieuxae*, were also recorded within the reserve and nearby localities.

### Résumé

Une nouvelle espèce de *Proboscidoplocia* est découverte dans la Réserve Naturelle Intégrale d'Andohahela. Les auteurs signalent la présence de *P. vayssierei* et *P. ruffieuxae* récoltés à l'intérieure et à l'extérieure de la réserve.

### Introduction

Members of the genus *Proboscidoplocia* are the largest mayflies in the world and are endemic to Madagascar. Six species were recognized by Elouard and Sartori (1997). During the biological inventory of the Réserve Naturelle Intégrale (NI) d'Andohahela in 1995 a previously undescribed species was collected. This mayfly is described below.

### *Proboscidoplocia mcaffertyi* Elouard & Sartori, new species (Figs. 6-1 to 6-3)

#### Description of the Male Imago

BODY—Length without cerci = 24.9 mm.

HEAD—Transverse, completely black. L. =

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0.38 mm; l. = 1.63 mm. Black eyes, located on the lateral extremity of the head capsule.

THORAX—Prothorax pale brown on the lateral tergite, whitish on the center. Its shape is tronconic, the narrower side behind the head. Meso- and metathoracic tergites greenish brown. Prothorax L. = 1.02 mm; l. ant. margin = 1.06 mm, l. post. margin = 1.7 mm; L. meso + metathorax = 13.5 mm.

FOREWINGS—Large and hyaline (Fig. 6-1a). Bordering cells of the posterior margin not very abundant and quite wide. Measurements in mm: L. = 15.9; l. = 8.4; L./l. = 1.89. Hindwings much smaller than the forewings, with few bordering cells (Fig. 6-1b). L. = 7.7; l. = 4.4; L./l. = 1.79. L. forewing/L. hindwing = 2.06.

LEGS—Dark brown in color. Measurements presented in Table 6-1 and illustrations in Figure 6-2a to 6-2c.

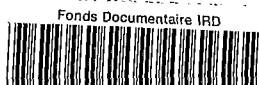
ABDOMEN—Light brown. L. = 10 mm. Wide at the last abdominal segment l. = 1.16 mm.

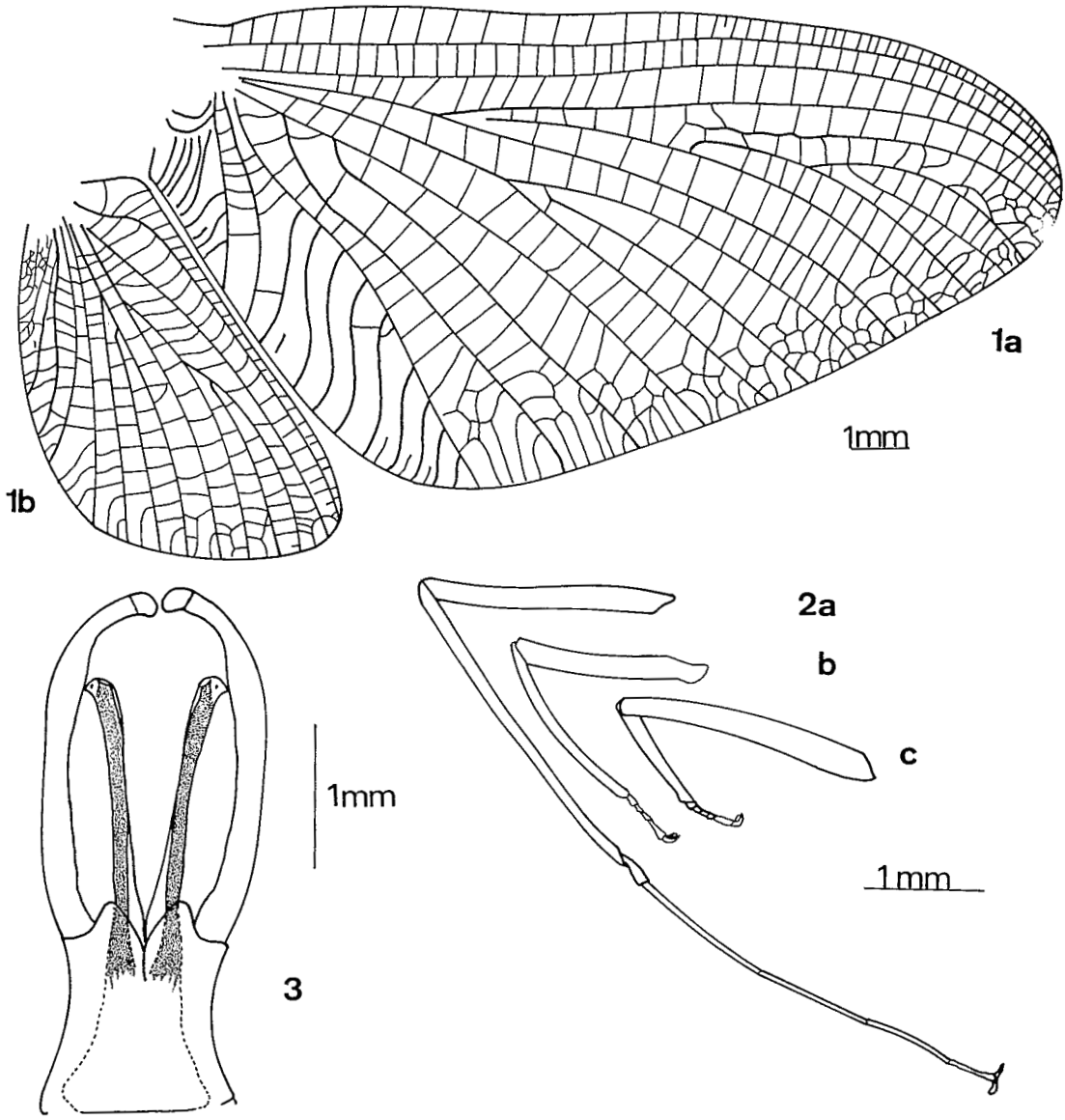
GENITALIA (Fig. 6-3)—Two segmented forceps-like structures, basal segment long, L. = 2.48

ELOUARD ET AL.: *PROBOSCIDOPLOCIA*

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FIGS. 6-1 to 6-3. Illustrations of the holotype of *Proboscidoplocia mccaffertyi*. (1a) Right forewing, (1b) right hindwing. (2a) Leg 1, (2b) leg 2, and (2c) leg 3. (3) Genitalia of the male imago, ventral view.

TABLE 6-1. Leg measurements (in mm) of *Proboscidoplocia mccaffertyi* (see Fig. 6-2).

	Femora	Tibia	Total tarsus	Tarsus 1	Tarsus 2	Tarsus 3	Tarsus 4	Tarsus 5
P1	2.1	2.9		0.32	1.2	0.96	0.9	0.4
P2	1.6	1.6	0.5					
P3	2.1	0.96	0.38					

FIGS. 6-4  
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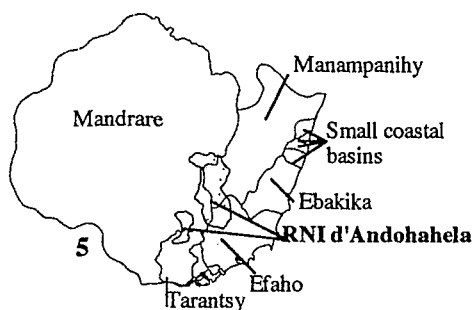
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1a



4  
Sampled stations (84)



5  
South-eastern basins



6  
*Proboscidoplocia mcaffertyi*



7  
*Proboscidoplocia ruffieuxae*



8  
*Proboscidoplocia vayssierei*



9  
*Proboscidoplocia* genus

FIGS. 6-4 TO 6-9. Distribution of *Proboscidoplocia* species in the southeastern Malagasy basins. (4) Map of sampled stations and hydrographical network around the RNI d'Andohahela. (5) Localization of the southeastern basins and the position of the RNI d'Andohahela. (6) *Proboscidoplocia mcaffertyi*, sp. n.; (7) *P. ruffieuxae*; (8) *P. vayssierei*; (9) *Proboscidoplocia* spp. in general (nymphs, male and female imagos).

1b) right

mm; apical segment short, L. = 0.19 mm. Penis quite wholly black, very long, reaching three-quarters of the forceps length (L. = 1.6 mm) and joined only in the most basal part.

CERCI—Broken and missing.

This species differs from other members of the genus *Proposidoplocia* essentially by the length of the penis and its nearly total separation outside of the body. The most closely related species is *P. billi* Elouard and Sartori, 1997.

ETYMOLOGY—This species is dedicated to W. P.

McCafferty, one the world's specialists on Ephemeroidea.

HOLOTYPE—Sample P0538, 23 November 1995, station St41-09 (camp 1, Fig. 6-6; see Chapter 1), Manampanihy Basin, Andranohela River, 46°45'34"E, 24°36'43"S, 525 m. Body in alcohol and wings, legs, part of cerci, and genitalia on slide preparations. Deposited in the Laboratoire d'Entomologie du Muséum National d'Histoire Naturelle (MNHN), Paris.

PARATYPES—This species is known only from

arsus 5

0.4

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the holotype. Some females and nymphs of this genus were recorded at the same station where the holotype of *Proboscidoplocia mcaffertyi* was collected, but for the time being we cannot assume that they belong to the same species.

#### Other *Proboscidoplocia* Species Recorded

Two other previously described *Proboscidoplocia* species were recorded in the RNI d'Andohahela. *Proboscidoplocia vaissyeri* Elouard and Sartori, 1997, was found in three streams near camp 1 in the forest zone of the upper part of the Manampanihy Basin. The elevation was around 525 m (Fig. 6-8). *Proboscidoplocia ruffieuxae* Elouard and Sartori, 1997, was obtained at several collecting stations of the Manampanihy Basin, one at 100 m outside of the reserve and the other at 525 m within a forested region of the reserve; at two sites in the Efaho Basin, at 70 and 120 m; and at one station in the upper streams of the Mandrare Basin, at 725 m (Fig. 6-7). Unidentified nymphs were recorded at numerous stations within and outside of the RNI d'Andohahela (Fig. 6-9). At this point we are unable to determine to which species these nymphs belong.

#### Discussion

*Proboscidoplocia* spp. live mainly in fresh-running rivers along the eastern coast and in the rivers of the upper basins of western Madagascar. Generally, they prefer clear forest streams with a current speed varying between 0.5 and 1.5 m/sec. Some species occur in small streams, while others frequent large rivers. In general, *Proboscidoplocia* species along the west coast occur at higher elevations than their congeners in eastern Madagascar. An abundance of rain, suitable air and wa-

ter temperatures, and the presence of forest are probably important factors that affect the distribution and greater speciosity of this genus in the eastern portion of the island.

The presence in the southeast of *Proboscidoplocia* on the Manampanihy River and close to (but outside of) a forested area is probably due to the influence of the nearby forest, which provides cooler water and a flow of rich organic material in the streams. Apart from collection sites located within forest areas of the reserve or in its immediate vicinity, *Proboscidoplocia* is absent from the lower part of the Mandrare, Manampanihy, and Efaho basins (Fig. 6-5). Thus, these organisms are completely dependent on the intact forests of southeastern Madagascar for their continued existence.

#### Acknowledgments

This study represents contribution 11 of the project "Biotypologie et biodiversité des eaux continentales malgaches," run jointly by CNRE and ORSTOM. The program is financed through the French Fonds d'Aide et de Coopération (FAC). We thank our colleagues at Laboratoire de Recherche sur les Systèmes Aquatiques et leur Environnement (LRSAE) for their help and assistance. We are deeply indebted to the Ministère de la Recherche Appliquée au Développement (MRAD) for the facilities made available to our research program. Maps were drawn with the CartoNOE software, written by O. Hertu.

#### Literature Cited

- ELOUARD, J.-M., AND M. SARTORI. 1997. *Proboscidoplocia*, a singular plural (Ephemeroptera, Polymitarcyidae), pp. 439-448. In Landolt, P., and M. Sartori, eds. Ephemeroptera and Plecoptera: Biology, ecology and systematics. MTL, Fribourg.

## Chapter 7 Three New the Réserve Madagascar

Jean-Luc Gattolliat

Two new species  
stage and for the  
imaginal stage  
discussed.

Deux nouvelles  
Intégrale d'Asie  
(Ephemeroptera)  
sont discutées

#### Introduction

Very few taxonomic  
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Three new species  
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<sup>1</sup> Musée Cantonal  
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<sup>2</sup> ORSTOM, BP  
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