Biodiversity, Biogeography and Nature Conservation in Wallacea and New Guinea

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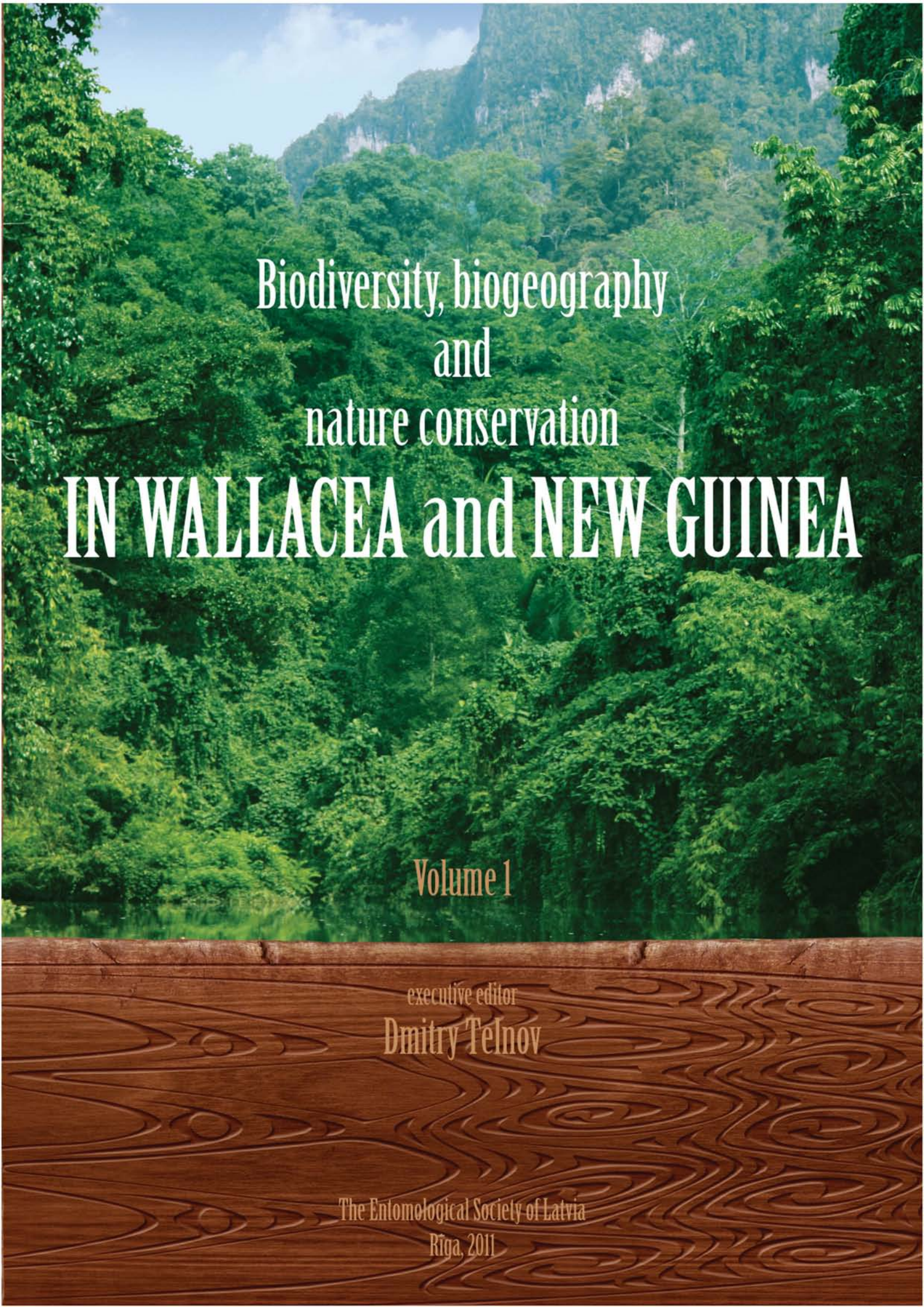

Biodiversity, biogeography and nature conservation IN WALLACEA and NEW GUINEA

Volume 1

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Contents

The Philippines in Wallacea

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Abstract: The Philippine archipelago's position in Wallacea has been a matter of debate and is a biogeographic problem that has never been fully settled. In the current review this problem is examined in light of comparative phylogenetic biogeography, tectonic history and panbiogeography. The information about these supports Dickerson et al. (1928) assertions on the faunal transition character of Wallacea and how this defines the biotic regions of the Philippines within Wallacea and its links with Sulawesi. There is a need to go beyond the Pleistocene paradigm in Philippine biogeography if a fuller understanding of the scale and dimensions of biodiversity in the Philippines is to be achieved.

Key words: Philippines, Wallacea, comparative biogeography, panbiogeography, Sulawesi.

Introduction

The Philippines is an archipelago of approximately 7000 islands in the Western Pacific (Fig. 1). The position of the archipelago with respect to Wallacea (Dickerson et al. 1928) has been a subject for debate in biogeography. Wallacea is defined to be the region between Wallace's Line in the west and Weber's Line to the east (Fig. 2). The original Wallace's Line delineated the islands west of the line. Huxley's modification of the line included all the oceanic islands of the Philippines east of the line (Mayr 1976; Simpson 1977). Wallace (1880) considered the islands to be part of the Oriental region but was separated from the Asian mainland at a very early date (Simpson 1977). Dickerson et al. (1928) placed the Philippines as the northern apex of the Wallacean "triangle". While traditionally Wallace's Line delineated the Asian biotic region from the Australian and Weber's Line delineated the Australian from the Wallacean, Dickerson et al (1928) considered Wallacea as a faunal transition zone largely depauperate in Asian and Australian representatives (Wallace 1880; Mayr 1976) but characterized by a significant degree of novel and relict endemism.

In this paper the position of the Philippines with respect to Wallacea is examined under the present theories of phylogenetic biogeography and the tectonic setting and reconstruction of the archipelago. The significance of the Gondwanan affinities of Philippine taxa shared with Wallacea will be assessed using a panbiogeographic framework.

The physical geographic, tectonic and biogeographic stetting of the Philippines

Physical geography

The Philippine archipelago can be divided into three groupings, Luzon, Visayas and Mindanao. Mindanao and Luzon are the two largest islands of Philippine archipelago. Luzon is the largest and most populous island of the Philippines with an area of 104688 km^2. It is orientated latitudinally from 18N to 12N and longitudinally from 119 to 123E. Mindanao is the second largest (97530 km^2) and most easternmost island in the Philippines. The island is orientated more longitudinally (121E to 126E) unlike Luzon. Luzon has four major mountain systems, the Eastern Sierra Madre, Caraballo, Central Cordillera and Zambales ranges. Mindanao has the most complex physiography of the Philippine islands. There are 5 mountain range systems on the island mainly of volcanic origin and correspond to the crustal blocks identified. The highest Philippine mountain, Mount Apo is located along the eastern region of the island. Luzon is composed of 7 crustal blocks while Mindanao has 6 crustal blocks. Luzon and Mindanao are separated by the Visayas islands, the second major geographical groupings. The major islands are part of the Philippines "hotspot" of biodiversity (Heaney et al. 1998). Luzon and Mindanao formed their respective Greater islands during the Pleistocene. Greater Luzon included the islands of Polilio and Catanduanes while Greater Mindanao included the Visayan islands of Samar and Leyte as well as Dinagat and Basilan islands. The Sulu

Figure 1. *Castiarina sedlaceki* Barker, 1988 from Mt. Kaindi (2300 m), the second known specimen (photo: U.Nylander).

Figure 2. Hitherto undescribed *Metataenia* species from Pawamanga village, Watut (photo: U.Nylander).

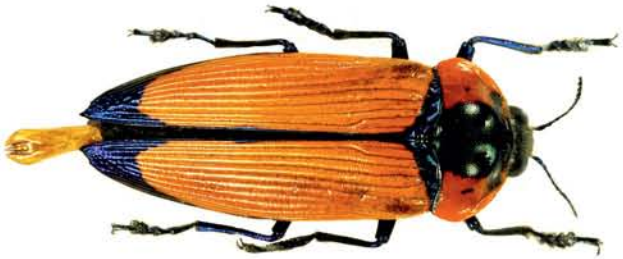

Figure 3. *Calodema longitarsis* Nylander, 2008 is only known by holotype specimen from Kerowagi (photo: U.Nylander).

Figure 4. *Calodema mariettae* Nylander, 1993, holotype specimen from Aseki (photo: U.Nylander).

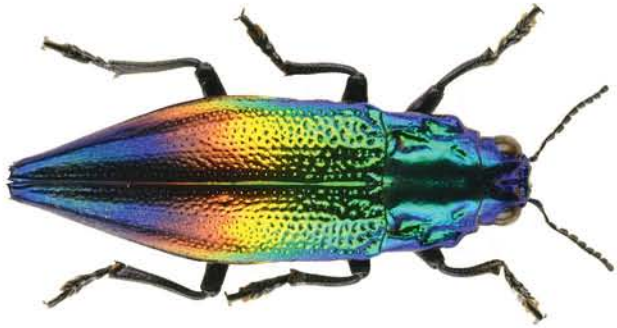

Figure 5. *Cyphogastara haidanae* Théry, 1923 from Gomemoa village, Garaina district, Morobe (photo: U.Nylander).

Figure 6. *Castiarina shelleybarkeri* Nylander, 2006 is only known by holotype specimen (photo: U.Nylander).

SAMPLE PLATE 2

Figures 1-6. *Ditropopsis fultoni* E.A.Smith, 1897, aberrant specimen from between Kokas and Goras, NE Onin peninsula (West New Guinea), with atrophied peripheral carina.

1: shell (lateral view with aperture); 2: shell (top view); 3: shell (bottom view); 4: operculum (internally); 5: operculum (externally); 6: operculum (laterally).