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# Australasian ants of the subfamily Heteroponerinae (Hymenoptera: Formicidae): (2) the species-group of *Heteroponera relicta* (Wheeler), with descriptions of nine new species and observations on morphology, biogeography and phylogeny of the genus

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## Abstract

Workers and available gynes of *Heteroponera relicta* and nine new related morphospecies from northeast Queensland tropical rainforest are described in two species complexes: *H. relicta* (Wheeler), *H. darlingtonorum, H. lioprocta*, *H. monteithi*, *H. rhodopygea, H. viviennae* and *H. wilsoni* **spp. n.** (*Heteroponera relicta* complex); *H. ecarinata*, *H. pendergrasti* and *H. trachypyx* **spp. n.** (*Heteroponera ecarinata* complex). Known gynes (of 3 *relicta*-complex species) are flightless physogastric ergatoids. Biogeography and evolution of the group and of *Heteroponera* at large are reviewed.

**Key words:** taxonomy, Australia, Queensland, Wet Tropics Heritage Area, Neotropical, South America, Gondwana, rainforest

## Introduction

The nine new species described below in the formerly monotypic species-group of *Heteroponera relicta* (Wheeler, 1915) raise the tally of named Australasian *Heteroponera* species to sixteen (Australia 15: New Zealand 1). The *H. relicta*-group, in which two species complexes are recognized, is known only from rainforest localities centered on the Wet Tropics World Heritage Area of Northeast Queensland. Its remarkably concentrated overall distributional range spans approximately 6 degrees of latitude from near Cooktown (15°28'S, 145°15'E) south to the vicinity of Cannonvale (20°16'S, 148°43'E), a latitudinal distance of only ca. 550 km. in which no collection record is more than ca. 35 km from the coast. This area covers less than 1% of the Australian continent, but supports a major proportion of its biota. The *H. relicta* group is thus regionally endemic in the sense of Yeates *et al.* (2002).

This paper fortuitously celebrates the centenary of William Morton Wheeler's (1915) description of *Heteroponera* (*"Paranomopone"*) *relicta* —the first of many Australian species he was eventually to name.

Taylor (2011) recognized three Australasian species groups in *Heteroponera* following Brown (1958), and reviewed the *H. leae* group (*H. leae* (Wheeler), *H. crozieri* Taylor and *H. majeri* Taylor). The remaining group of *H. imbellis* (Emery) includes the New Zealand endemic *H. brouni* (Forel) and several Australian nominal species listed as synonyms of *H. imbellis* by Brown (1958). Note that Wheeler's (1923) correction of Forel's faulty epithet "*brownii*" to "*brouni*" is accepted here, following Brown (1958) and most subsequent authors.

*Heteroponera* species are known only from Australia, New Zealand, and the Neotropics, with putative southern, Gondwanic, biogeographic connections linking the amphipacific faunas (Feitosa, 2011; Taylor, 2011). The type-species of the genus is the Chilean *H. carinifrons* Mayr (1887: 532). Feitosa (*pers comm.*) currently recognizes 14 Neotropical species (13 formally named, two probable junior synonyms, and three undescribed species).

Taxonomic distinction of the *relicta*, *leae* and *imbellis* groups in Australia is supported by Feitosa's (2011) phylogenetic analysis. In his cladograms (*ibid.*, fig 4): (1) The *leae*-group species *H. leae* and *H. crozieri* (the latter given as "*Heteroponera* sp B") are sister taxa and share a common higher-order clade with *H. brouni* and three

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**Worker diagnosis.** General features, conformation, color and major sculpturation as illustrated and in appropriate key couplets above. Characterized in the *H. ecarinata* species complex by heavy sculpturation, dark blackish color, with dark brown legs and antennae, and distinguished from the similar *H. ecarinata* by differences in sculpturation (particularly of the frons and second gastral tergite), coloration and structure of the petiolar node. Fore-coxae and posterior surface of node superficially microsculptured; propodeal declivity shining, with weak, superficial dorsally-directed radial striae; its sides distinctly sculpturally bordered, the posterolateral edge in profile micro-serrate as a result of minutely extended cuticular points along the sculptural border. Sculpturation of second gastral tergite more distinctly longitudinally deployed than in *H. ecarinata* (refer Figs). Dimensions: (holotype; smallest available specimen, largest available specimen (both Mt): TL (ca): 5.1, 4.8, 5.1; HW: 1.23, 1.18, 1.23; HL: 1.19, 1.17, 1.18; CI: 103, 100, 104; EL: 0.16, 0.16, 1.18; SL: 0.71, 0.69, 0.70; SI: 57, 58, 57; PW: 0.86, 0.86, 0.90;WL: 1.54, 1.49, 1.58; petH: 0.85, 0.79, 0.90; petW: 0.46, 0.47, 0.47; GW 0.99, 0.96, 1.03.

**Related taxa.** See above under *H. ecarinata*.

**In-group sympatric associations.** *Heteroponera relicta* and *H. pendergrasti* are both present in QMBA Berlesate 804.

**Biogeography.** known only from Lamb Range, the northern rampart of the Atherton Tableland. *H. pendergrasti* is possibly endemic there. Note the frequency of accessions by various collectors, and the absence of records in the well-known, generally well collected and more frequently visited nearby EA9, Atherton Tableland and EA6 Black Mountain localities.

**Remarks.** The apically sub-dentate petiolar node is (probably homoplasiously and convergently) similar to those of some Neotropical species (Brown 1958; Feitosa 2011).

**Etymology.** Named for Professor J.G. (Jim) Pendergrast of Auckland, New Zealand, my first teacher in Zoology at both High School and (in a later position) at The University of Auckland, where he supervised my M.Sc. degree.

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