

three species among the ants morphologically identical with or close to *T. pacificum*. Our three-species-hypothesis was based on worker morphology, especially on overall body size, overall colour, head proportions, spine length and petiole shape. Based on qualitative comparison with type specimens, we tentatively name the three entities *T. pacificum*, *T. scabrum* MAYR, 1879, and *T. manobo*. *Tetramorium scabrum* has been synonymized with *T. pacificum* by BOLTON (1977).

High-precision morphometric analyses enable the discrimination of very similar species, also in ants (e.g., SEIFERT 2002). However, groups with small interspecific and high intraspecific variation are often poorly resolved by morphological methods alone (for review: WIENS 1999) and in such cases molecular genetic analyses may provide complementary information. Morphologically most similar species may differ markedly in mitochondrial DNA, as shown, among others, for *Tetramorium* ants (SCHLICK-STEINER & al. 2006b, STEINER & al. 2006c). Congruence of DNA and morphology data supports evolutionary hypotheses much more strongly than any of these approaches alone (WETTERER & al. 1998, CHIOTIS & al. 2000, WIENS & al. 2003, WARD & DOWNIE 2005, HASEGAWA & CROZIER 2006, STEINER & al. 2006c).

In this paper we test the above three-species-hypothesis. We conduct morphometric analyses and sequence analyses of the mitochondrial gene cytochrome c oxidase I, *COI*. Unfortunately, the type material of *T. manobo* was not available for re-examination in the course of the present study, but we present morphometric data on the holotype compiled by Stefan Schödl.

Material and methods

Prior to analyses conducted during this study, *Tetramorium* specimens were identified using the key and the species descriptions in BOLTON (1977). The correctness of synonymies given by BOLTON (1977) for *T. bicarinatum* and *T. insolens* was not questioned. Further taxonomic studies were limited to species which keyed out as *T. pacificum*.

Material examined

A total of 278 specimens safekept in the following collections was analysed:

CBFS	Coll. B.C. Schlick-Steiner & F.M. Steiner, Vienna, Austria
CMP	Coll. M. Pfeiffer, Ulm, Germany
CZW	Coll. H. & S.V. Zettel, Vienna, Austria
HNHM	Hungarian Natural History Museum, Budapest, Hungary
MHNG	Muséum d'Histoire Naturelle, Geneva, Switzerland
NHMW	Natural History Museum, Vienna, Austria
UPLB	Museum of Natural History, University of the Philippines, Los Baños, Laguna, The Philippines
USC	University of San Carlos, Cebu City, The Philippines
ViSCA	Leyte State University (formerly Visayan College of Agriculture), Baybay, Leyte, The Philippines
ZSBW	Zoologische Sammlung des Biozentrums der Universität Würzburg, Würzburg, Germany

All analysed specimens are listed in the following, with geographical grouping below the level of countries according to physical rather than political entities in case of dis-

crepancies between the two. The sign # refers to collection numbers, but frequently does not represent nest series. The number of examined workers that were morphometrically analysed is given in [] and the number of examined workers *COI* sequenced is given in { }, the latter along with the code of voucher specimens, and the GenBank accession numbers.

Tetramorium pacificum MAYR, 1870

China: Hong Kong: eastern New Territories, Lower Wong Chuk Valley, Lungmei (22° 24' N, 114° 15' E), 1.XI.1996, leg. J. Fellows (# 2), 1 ♀ [1] (CBFS); Hainan Is.: Bawangling NNR (19° 04' N, 109° 04' E), 3.IV.1998, leg. J. Fellows (# 5), 2 ♀♀ [1] (CBFS).

Thailand: Surat Thani Prov.: Khao Sok NP (8° 54' N, 98° 31' E), 30.XI. - 1.XII.2002, leg. F. Seyfert (# 15), 1 ♀ [1] (CZW).

Singapore: Singapore Zoo, 12.I.2002, leg. H. Zettel (# 2), 1 ♀ [1] (CZW); National University of Singapore, campus, 26. - 28.I.2002, leg. H. Zettel (# 1), 1 ♀ [1] (CZW); *ibid.*, 21.X. - 7.XI.2003, leg. H. Zettel (# 1), 15 ♀♀ [3] (CZW).

Indonesia: Krakatoa, Sertung Is.: 16.VIII.2005, leg. S. Yamane (# RK05-SKY-88), 2 ♀♀ [1] {1, T391 = b&f15599, GenBank DQ523554} (CBFS); Krakatoa, Sebesi Is.: 13.VIII.2005, leg. S. Yamane (# RK05-SKY-53), 1 ♀ [1] {1, T397 = b&f15597, GenBank DQ523552} (CBFS); *ibid.*, 12.VIII.2005, leg. S. Yamane (# RK05-SKY-39), 1 ♀ [1] (CBFS); *ibid.*, 13.VIII.2005, leg. S. Yamane (# RK05-SKY-50), 2 ♀♀ [2] {1, T394 = b&f15598, GenBank DQ523553} (CBFS).

Malaysia: Borneo Is.: Sabah: Tawau, 11.X.2004, leg. M. Pfeiffer (# zo6), 2 ♀♀ [2] (CMP); *ibid.*, 5.X.2004, leg. M. Pfeiffer (# xa330), 1 ♀ [1] (CMP); *ibid.*, 1.X.2004, leg. M. Pfeiffer (# xa259), 2 ♀♀ [2] (CMP); *ibid.*, 16.X.2004, leg. M. Pfeiffer (# zo120), 2 ♀♀ [1] (CMP); Sarawak: Banting, 19.VIII.2005, leg. M. Pfeiffer, (# ba666), 2 ♀♀ [2] (CMP).

Philippines: Luzon Is.: Benguet Prov., W Baguio, Asin, Road km 7, 17.II.1999, leg. S. Schödl (# 11), 2 ♀♀ [1] (NHMW); Laguna Prov., Mt. Makiling, 13. - 18.XI.1992, leg. H. Zettel (# 1), 2 ♀♀ [2] (CZW); Camarines Sur Prov., Alanao, Bahi River, 14.II.1999, leg. H. Zettel (# 205), 17 ♀♀ [2] (CZW); Camarines Sur Prov., Lupi, Sooc, 1. - 9.IV.2000, var. collectors (# 252), 1 ♀ [1] (CZW); Albay Prov.: 40 km N Legaspi, 1 km W Malilipot, Busai Falls, 23. II.1998, leg. H. Zettel (# 143), 1 ♀ (CZW); Catanduanes Is.: W Bato, Maribini Falls, 6.III.1999, leg. H. Zettel (# 194), 1 ♀ (CZW); W Virac, Sto. Domingo, Pajo River area, 10.III.1999, leg. H. Zettel (# 199), 1 ♀ (CZW); Negros Is.: Negros Oriental Prov., W Dumaguete, Valencia, Apolong, Casaroro Falls, 26.II.1997, leg. H. Zettel (# 118), 1 ♀ (CZW); Cuernos de Negros, Valencia, Apolong, Casaroro Falls, 9. - 13.III.2005, leg. H. Zettel (# 420), 1 ♀ [1] {1, T386 = b&f15380, GenBank DQ523549} (CBFS); W Dumaguete, Valencia, Apolong, Banica River, 24.X.2004, leg. C. Pangantihon (# P399), 1 ♀ [1] (CZW); Cebu Is.: S Badian, Matutinao, Kawasan Falls, 2 - 50 m, 23. - 24.II.1997, leg. H. Zettel (# 116), 2 ♀♀ [2] (CZW); S Badian, Matutinao, Kawasan Falls, 1 - 30 m, 11.XI.2003, leg. C. Pangantihon (# P352a), 1 ♀ [1] (CZW); SE Moalboal, Balabagon, Busai Spring, 2.XII.1996, leg. H. Zettel (# 114), 1 ♀ [1] (CZW); Samar Is.: Western Samar Prov., SE Gandara, Blanca Aurora Falls, 26.I.2000, leg. H. Zettel (#