

C. JUCKER, F. RIGATO, R. REGALIN

Exotic ant records from Italy (Hymenoptera, Formicidae) (*)

Abstract - We report records of several exotic ant species in Italy, including the major tramp species *Tapinoma melanocephalum* (F.), *Technomyrmex pallipes* (F. Smith), *Tetramorium bicarinatum* (Nyl.) and *Wasmannia auropunctata* (Roger).

Riassunto - *Segnalazioni di formiche esotiche per l'Italia (Hymenoptera, Formicidae)*.

Riportiamo diverse segnalazioni di formiche esotiche in Italia, incluse le significative *Tapinoma melanocephalum* (F.), *Technomyrmex pallipes* (F. Smith), *Tetramorium bicarinatum* (Nyl.) e *Wasmannia auropunctata* (Roger).

Key words: exotic ants, Italy, new records, pest.

INTRODUCTION

Biological invasions resulting from human commerce are a serious threat to global biodiversity. In particular, exotic pest ant species can cause damage, especially to agriculture and stored products, and they can also successfully compete with native ant species (Williams, 1994; Holway *et al.*, 2002). Passera (1994) summarized biological characteristics of tramp ants. Usually they are small, omnivorous, polygynous (i.e. with more than one ovipositing queen), and found new colonies by budding. Moreover, neighboring colonies do not compete one against other. Because of their small size and their ability to nest in different materials, ants can easily be transferred. In temperate regions, most tropical ants have been found in greenhouses or other heated building only (Williams, 1994).

Exotic ants recorded from Italy include the well-known Argentine ant, *Linepithema humile* (Mayr) and the pharaoh ant, *Monomorium pharaonis* (Linnaeus). Baroni Urbani (1971) listed several Italian localities and references for both. The present work examines the occurrence of some other exotic ants in Italy.

(*) Work published with a grant of the Research Project "Prevention and preservation of agriculture and environment from exotic pests - PREVENTO" financed by Ministry of Agriculture and Forest Policies and the Research Project "Individuation of Exotic Arthropods in Lombardy - INARRESTO" financed by Lombardy Region.

METHODS

In April-September 2006, graduate students from the Istituto di Entomologia Agraria, University of Milan, surveyed insects at Cargo City, on the grounds of Milan's Malpensa International Airport (45°37'N, 8°43'E). We collected ants inside a storage hangar, where mostly exotic plants, flowers, vegetables, and fruits are stored before being dispatched to their final destination. Additional records came from private citizens who submitted some specimens to us for identification, and from specimens we found in the collections of our institutions or among the material collected by some colleagues.

Specimens are deposited at:

IEUM: Istituto di Entomologia Agraria, University of Milan, Italy

MSNM: Museo Civico di Storia Naturale, Milan, Italy

MSNV: Museo Civico di Storia Naturale, Verona, Italy

MZUF: Museo Zoologico "La Specola", University of Florence, Italy

RESULTS

We recorded eleven exotic ant species at Cargo City. Five of these were common tropical tramp species: *Cardiocondyla wroughtonii* (Forel), *Paratrechina bourbonica* (Forel), *Pheidole megacephala* (Fabricius), *Tapinoma melanocephalum* (Fabricius), and *Technomyrmex albipes* (F. Smith). The other six are not known as tramps: *Crematogaster* sp., *Dolichoderus thoracicus* (F. Smith), *Nesomyrmex* sp., *Pheidologeton affinis* (Jerdon), *Pheidologeton diversus* (Jerdon), and *Technomyrmex elatior* Forel. Specimens of these taxa are deposited at IEUM.

In addition, we recorded the following exotic ants:

Camponotus atriceps (F. Smith): Emilia Romagna, no locality data, greenhouse, on *Dracaena fragrans* trunks (2 workers without further data in Poldi collection) (MSNM).

Lasius neglectus Van Loon *et al.*: Venice, Lido (workers and queens, 45°24'N, 12°22'E, May 1991, A. Salvarani leg.). Parco Nord Milano (many specimens of all castes, 45°32'N, 9°13'E, May-July 1994, F. Rigato leg.) (MSNM).

Tapinoma melanocephalum (Fabr.): Rozzano (Milan), in apartment kitchen (workers, 45°23'N, 9°09'E, 26 April 2007, P. Della Rovere leg.) (IEUM).

Technomyrmex pallipes: Milan, apartment (45°28'N, 9°11'E, June 2002, collector unknown) (MSNM).

Tetramorium bicarinatum (Nylander): open habitat at Sena, near Cropani Marina (Catanzaro prov.) (one worker, 38°56'N, 16°49'E, 14 July 2004, A. Scupola leg.) (MSNV).

Tetramorium lucayanum Wheeler: Bruzzano (Milan), greenhouse (several workers, 45°31'N, 9°16'E, September 1991, F. Rigato leg.) (MSNM).

Wasmannia auropunctata (Roger): Aeolian Archipelago, Lisca Bianca Island (one worker; 38°38'N, 15°07'E, April 1996, P. Lo Cascio & V. Pancioli legg.) (MZUF).

Species Accounts (+ = no previous records from Italy)**+*Cardiocondyla wroughtonii* (Forel)**

This harmless ant probably originates from SE Asia and is one of several *Cardiocondyla* spread in many tropical and subtropical countries by human commerce (Bolton, 1982).

+*Camponotus atriceps* (F. Smith)

This large Neotropical carpenter ant was not previously recorded from Europe.

+*Dolichoderus thoracicus* (F. Smith)

No previous European records for this common arboreal SE Asian ant.

***Lasius neglectus* Van Loon *et al.* (Fig. 1)**

In Italy, Seifert (2000) previously reported this species from Volterra in Tuscany. *Lasius neglectus* probably originates from temperate West Asia. Its first European record came from Budapest in 1974 (Van Loon *et al.*, 1990). It has since spread across Europe and now is reported from urbanized habitats of many European countries where it successfully competes with native ants (see Radchenko 2004). This species may be easily overlooked because of its morphological similarity with some native *Lasius*.

+*Paratrechina bourbonica* (Forel)

Paratrechina bourbonica is an Old World tramp species spread through human commerce. Radchenko (2004) reports it from United Kingdom and Vierbergen (2003) from The Netherlands.

***Pheidole megacephala* (Fabricius) (Figs. 2, 3)**

In Italy, Limonta & Colombo (2003) reported *Pheidole megacephala* collected in 2001 in a plant nursery at Parabiago (45°34'N, 8°57'E), near Milan. This well known tropicopolitan pest is of Afrotropical origin. European records from Radchenko (2004) include: Azores, British Islands, Crete, Dodecanese Islands, France, Madeira, Romania and Yugoslavia. Vierbergen (2003) reports it from The Netherlands. Ceballos (1956) reported several localities and references for Spain; yet Gómez & Espadaler (2007) do not list it among Iberian ants.

+*Pheidologeton affinis* (Jerdon)**+*Pheidologeton diversus* (Jerdon)**

These SE Asian “swarm-raiding” ants were not previously found in Europe.

+*Tapinoma melanocephalum* (Fabricius) (Fig. 4)

The “ghost ant” is very widespread especially in the tropics, its native territory is uncertain (Wilson & Taylor, 1967). *T. melanocephalum* is considered a significant urban pest; in Florida, for instance, it infests houses, causing nuisance and infesting food (Klotz *et al.*, 1995). In temperate regions it is generally found in heated buildings or inside structures (Harris *et al.*, 2005), especially in places with a high degree of humidity and temperature, such as greenhouses, bathrooms and kitchens (Espadaler & Espejo, 2002). The species is also known from the following European countries: Austria (Steiner *et al.*, 2003), Belgium (Dekoninck *et al.*, 2006), Denmark (Jespersen & Christensen, 2003), Finland (Sorvari, 2002), France (Hugel *et al.*, 2003), Germany (Scheurer, 1984), Norway (Gederaas *et al.*, 2007), Romania (Radchenko, 2004), Russia (Kunashev & Niyazova, 1998), Spain (Espadaler & Espejo, 2002), Sweden (Hagström *et al.*, 2005), Switzerland (Dorn *et al.*, 1997), The Netherlands (Vierbergen, 2003), U.K. (Williams, 1956; Shah & Pinniger, 1996).

+*Technomyrmex albipes* (F. Smith) (Fig. 5)**+*Technomyrmex elatior* Forel**

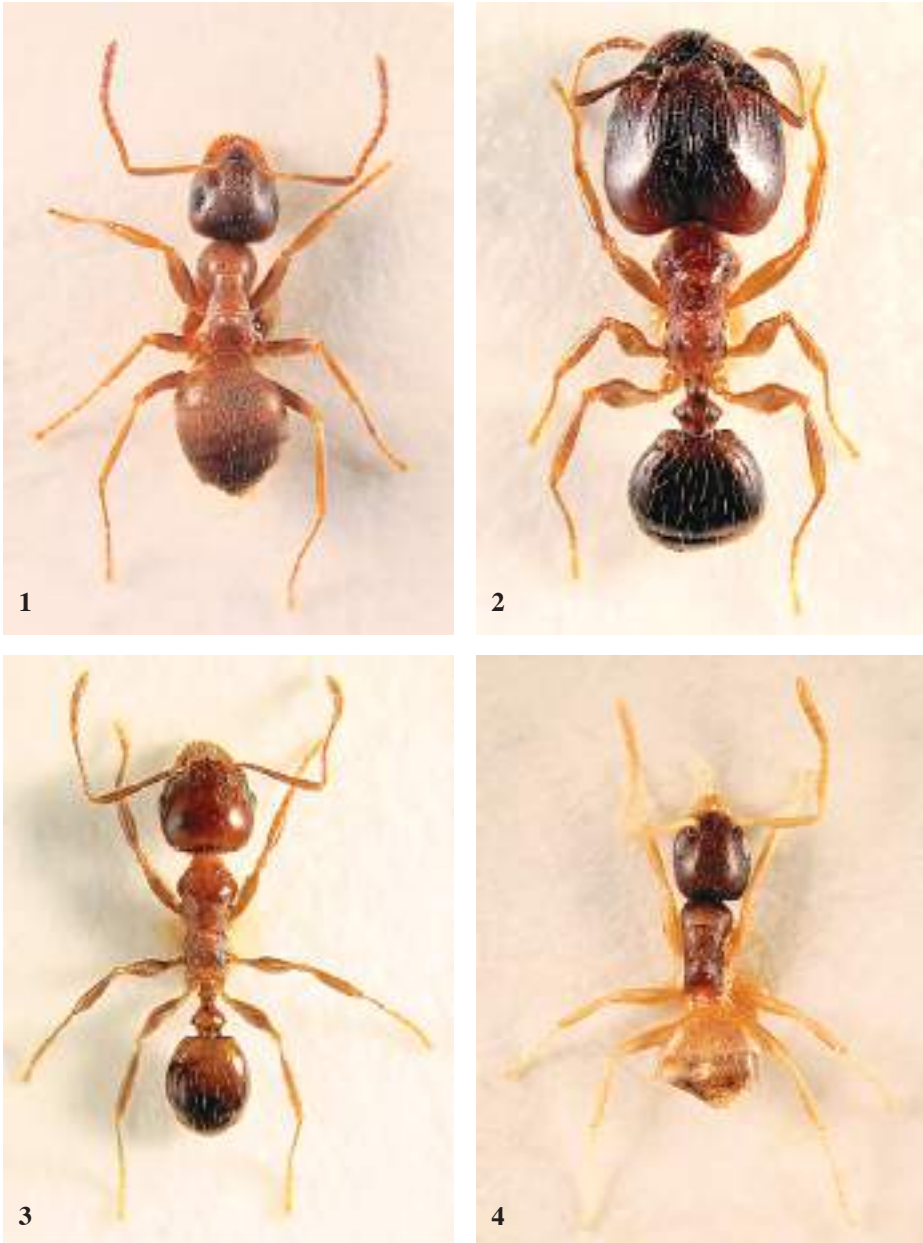


Fig. 1 - 4: 1, *Lasius neglectus* (full length: 3 mm ca.); 2, *Pheidole megacephala* (major worker, full length: 4.6 mm ca.); 3, *Pheidole megacephala* (minor worker, full length: 3 mm ca.); 4, *Tapi-noma melanocephalum* (full length: 1.7 mm ca.).



Figg. 5 - 7: 5, *Technomyrmex albipes* (full length: 2.6 mm ca.); 6, *Tetramorium bicarinatum* (full length: 3.3 mm ca.); 7, *Wasmannia auropunctata* (full length: 1.6 mm ca.).

+*Technomyrmex pallipes* (F. Smith)

T. albipes and *T. elatior* are native of tropical Asia and are widespread in that region (Bolton, 2007); also, *T. albipes* is a renowned tramp ant with pest status. Just the latter was already reported from Europe: from hothouses in the U.K. (Bolton, 2007) and from The Netherlands (Vierbergen, 2003). However last record may be considered as doubtful because it was published before Bolton's revision of the genus. *T. pallipes* is an Afrotropical species closely related to *T. albipes*. Bolton (2007) reported *T. pallipes* from U.K.

***Tetramorium bicarinatum* (Nylander) (Fig. 6)**

In Italy, *Tetramorium bicarinatum* was previously recorded close to Milan in a plant nursery (Limonta & Colombo, 2003). *T. bicarinatum* is common in many tropical and subtropical countries, especially on islands. It probably originates from SE Asia and is virtually absent from the Afrotropical region (Bolton, 1977). In temperate countries it has been reported from greenhouses and other heated buildings. This species was cited from several European countries as *T. guineense* (Fabricius). Stitz (1939) reported it from Austria, Germany and Hungary; Pisarski (1957) added a few other records from the same countries and Poland. Bolton (1977) corrected *T. guineense* into *T. bicarinatum* and listed several localities from U.K. plus Amsterdam (The Netherlands). Gederas *et al.* (2007) reported it from Norway. Also, this species together with the other tramps *T. caldarium* (Roger) and *T. lanuginosum* Mayr was recently reported from open habitats in Spain (Reyes & Espadaler, 2005).

+*Wasmannia auropunctata* (Roger) (Fig. 7)

The possibility that the renowned and widespread "little fire ant" could survive in open habitats in the relatively warm southern Italy cannot be excluded. Yet no further data were collected in recent years. This species is a widespread pest of Neotropical origin and it may strongly influence native ant faunas (Wetterer & Porter, 2003). Under temperate climates it may be a greenhouse dweller and was introduced in several tropical countries all around the world. For Europe, Donisthorpe (1927) reported it from England in greenhouses and in a banana store.

CONCLUSIONS

The above-mentioned species are surely just a part of what we could find if a careful survey of the Italian alien ant fauna was possible. At present, most of these exotic species seem relatively harmless both considering natural environments and human beings. They are nearly always of tropical origin; so they can thrive especially in artificial environments, i.e. greenhouses and other heated buildings. Yet an invader like *Lasius neglectus* lives outdoors and can be considered as a serious threat especially for native ants. The presence of several alien, including non-tramp, species at Malpensa airport shows how it is difficult to cope with these overlooked invaders. Of course, it depends on the increasing mobility of human beings and their goods, which cannot be completely controlled. Mated queens or even small ant colonies can easily escape and spread when they find favourable conditions. So, in the near future further findings of exotic species are expected.

ACKNOWLEDGEMENTS

We wish to express our gratitude to Antonio Scupola (MSNV), Piero Della Rovere (Milan), Marta Valentini and Pablo Morlacchi (IEUM), who provided us with several specimens. Barry

Bolton (Isle of Wight, UK) kindly determined all *Technomyrmex* specimens. Also, we are very grateful to James Wetterer (Florida Atlantic University, USA) who strongly improved our manuscript and gave us many important suggestions and data. Last, we have to thank Michele Zilioli (MSNM) for the photographs.

REFERENCES

- BaroNI UrBaNI C., 1971 - Catalogo delle specie di Formicidae d'Italia. - Memorie della Società entomologica italiana, 50: 5-287.
- BoLTon B., 1977 - The ant tribe Tetramoriini. The genus *Tetramorium* Mayr in the Oriental and Indo-australian regions, and in Australia. - Bulletin of the British Museum (Natural History), Entomology series, 36: 67-151.
- BoLTon B., 1982 - Afrotropical species of the myrmicine ant genera *Cardiocondyla*, *Leptothorax*, *Melissotarsus*, *Messor* and *Cataulacus*. - Bulletin of the British Museum (Natural History), Entomology series, 45: 307-370.
- BoLTon B., 2007 - Taxonomy of the dolichoderine ant genus *Technomyrmex* Mayr based on the worker caste. - Contributions of the American Entomological Institute, 35: 1-150.
- CeBaLLoS G., 1956 - Catálogo de los Himenópteros de España. - Instituto Español de Entomología, Madrid, 554 pp.
- DeKoNINCK W., WeGNez P., e SPaDaLer X., GrooT aerT P., 2006 - First record of infestation of the ghost ant *Tapinoma melanocephalum* (Fabricius, 1793) in Belgium (Hymenoptera, Formicidae) - a new indoor pest problem for the country?. - Bulletin de la Société royale belge d'Entomologie, 142: 25-28.
- DoNISTHorPe J.K., 1927 - British Ants. Their life-history and classification. Second ed. revised and enlarged. - G. Routledge & Sons, London: xv + 436 pp., 18 pls.
- DorN K., LaNDaU I., CHerIX D., 1997 - Einschleppung von *Tapinoma melanocephalum* (Formicidae) in der Schweiz. - Mitteilungen der Schweizerischen Entomologischen Gesellschaft, 70: 242-243.
- e SPaDaLer X., e SPeJo F., 2002 - *Tapinoma melanocephalum* (Fabricius, 1793), a new exotic ant in Spain (Hymenoptera, Formicidae). - Orsis, 17: 101-104.
- GeDeraaS L., SaLVeSeN I., VIKeN Å. (Eds.), 2007 - Norsk svarteliste 2007, Økologiske risikovurderinger av fremmede arter. 2007 Norwegian Black List, Ecological Risk Analysis of Alien Species. - Artsdatabanken, Norway: 152 pp.
- GÓMez K., e SPaDaLer X., 2007 - Hormigas ibericas. - <http://www.hormigas.org/>
- HaGSTrÖM T., JoNSSon C., NorDaNder T., 2005 - Faunistiskt nytt 2004 - Insecter. - Göteborgs Naturhistoriska Museum Årstryck, 2005: 25-28.
- HarrIS r., a BBoTT K., BarToN K., BerrY J., DoN W., GUNaWarDaNa D., LeSTer P., r ees J., STaNLey M., SUTHerLaND a., ToFT r., 2005 - Invasive ant pest risk assessment project for Biosecurity New Zealand. - Series of unpublished Landcare Research contract reports to Biosecurity New Zealand. BAH/35/2004-1.
- HoLWaY D.a., L a CHL., SUa rez a.V., TSUTSUI N.D., CaS e T.J., 2002 - The causes and consequences of ant invasions. - Annual Review of Ecology and Systematics, 33: 181-233.
- HUGeL S., CaLLoT H., DeLeCoLLe J.C., 2003 - Insectes exotiques et/ou nouveaux pour la France dans le serres du Jardin Botanique de Strasbourg (Orthoptera: Rhapiphoridae, Hymenoptera: Formicidae, Diptera: Ceratopogonidae). - Bulletin de la Société Entomologique de Mulhouse, 59 (4): 69-73.

- JeSPeR SeN J.B., CHrI STeNSeN M., 2003 - Danish Pest Infestation Laboratory, Annual Report 2002. - Lyngby: 60 pp.
- KLoTz J.H., MaNGoLD J.F., VaIL K.M., DaV IS L.R., PaTTeR SoN r .S., 1995 - A survey of the urban pest ants (Hymenoptera: Formicidae) of Peninsular Florida. - Florida Entomologist, 78: 109-118.
- KUNaSheV M.V., NIYaZoVa M.V., 1998 - On the discovery of *Tapinoma melanocephalum* (Dolichoderinae) in Moscow. Ants and Forest Protection. - Materials of the 10th All-Russian Myrmecological Symposium, Peshki, 24-28 August 1998: 153 (in Russian).
- LIMoNTa L., CoLoMBo M., 2003 - Record of *Pheidole megacephala* (F.), *Pheidole nodus* Smith and *Tetramorium bicarinatum* Nylander (Hymenoptera Formicidae), tropical species, in nursery imported plants. - Bollettino di Zoologia Agraria e di Bachicoltura, Ser. II, 35 (2): 287-289.
- PaSSeRa L., 1994 - Characteristic of tramp species. In: Williams D.F. (Ed.), Exotic ants. Biology, impact, and control of introduced species. - Westview Press, Boulder, Colorado, USA: 23-43.
- PISaRSKY B., 1957 - O występowaniu egzotycznych gatunków mrówek w Polsce. - Fragmenta Faunistica, 7: 283-288.
- r aDChENKo a., 2004 - Fauna Europaea: Formicidae. In: Noyes J. (Ed.) (2004) Fauna Europaea: Hymenoptera: Apocrita. Fauna Europaea version 1.1 - <http://www.faunaeur.org/>
- r eYeS J. & eSPaDaLeR X., 2005 - Tres nuevas especies foráneas de hormigas para la Península Ibérica. - Boletín de la S. E. A., 36: 263-265.
- SCHeUreR S., 1984 - Erstnachweis des Higienschädlings *Tapinoma melanocephalum* (Hymenoptera, Formicidae) in der DDR. - Angewandte Parasitologie, 25 (2): 96-99.
- SeIFeRt B., 2000 - Rapid range expansion in *Lasius neglectus* (Hymenoptera, Formicidae) - an Asian invader swamps Europe. - Mitteilungen aus dem Museum für Naturkunde in Berlin, Deutsche entomologische Zeitschrift, 47: 173-179.
- SHaH V., PINNIGeR D., 1996 - A new pest problem? An infestation of ghost ants *Tapinoma melanocephalum* in South London. - In: Willey K.B. (Ed.), Proceedings of the 2nd international conference on insect pests in the urban environment, ICIUPE, Edinburgh: 601.
- SorVarI J., 2002 - *Tapinoma melanocephalum* (Fabricius, 1793) (Hymenoptera: Formicidae), an imported ant species new to Finland, with observations and a taxonomic note. - Entomologist's Gazette, 53: 269-270.
- STeINer F.M., SCHLICK-STeINer B.C., SHöDL S., ZeTTeL H., 2003 - Neues zur Kenntnis der Ameisen Wiens (Hymenoptera: Formicidae). - Myrmecologische Nachrichten, 5: 31-35.
- STITz H., 1939 - 37. Hautflügler oder Hymenoptera. 1. Ameisen oder Formicidae. In: Dahl F. (Ed.), Die Tierwelt Deutschlands und der angrenzenden Meeresteile, nach ihren Merkmalen und nach ihrer Lebensweise. - G. Fischer, Jena: 428 pp.
- VaN LooN a.J., B oomSMa J.J., a NDraSF aLVY a., 1990 - A new polygynous *Lasius* species from Central Europe. I. Description and general biology. - Insectes Sociaux, 37: 348-362.
- VierBerGeN B., 2003 - *Technomyrmex albipes* en andere extoten in Nederland. - Forum Formicidarum, 4 (2): 4-7.
- WeTTereR J.K., PoRTER S.D., 2003 - The little fire ant, *Wasmannia auropunctata*: distribution, impact, and control. - Sociobiology, 42: 1-41.
- WILLIAMS G.C., 1956 - Records on an established infestation of *Tapinoma melanocephalum* F. (Hym. Formicidae) in Great Britain. - Entomologist's Monthly Magazine, 92: 329-330.
- WILLIAMS D.F. (Ed.), 1994 - Exotic ants: Biology, Impact, and Control of Introduced Species. - Westview Press, Boulder, Colorado: 332 pp.

WILSON E.O., TAYLOR R.W., 1967 - The ants of Polynesia. - Pacific Insects Monograph, 14: 1-109.

Dr COSTANZA JUCKER, RENATO REGALIN - Istituto di Entomologia agraria, Università degli Studi di Milano, Via Celoria 2, I-20133 Milano (Italy). E-mail: costanza.jucker@unimi.it
renato.regalin@unimi.it

Dr FABRIZIO RIGATO - Museo Civico di Storia Naturale, Corso Venezia 55, I-20121 Milano (Italy).
E-mail: Fabrizio.Rigato@comune.milano.it

Accepted 7 April 2008