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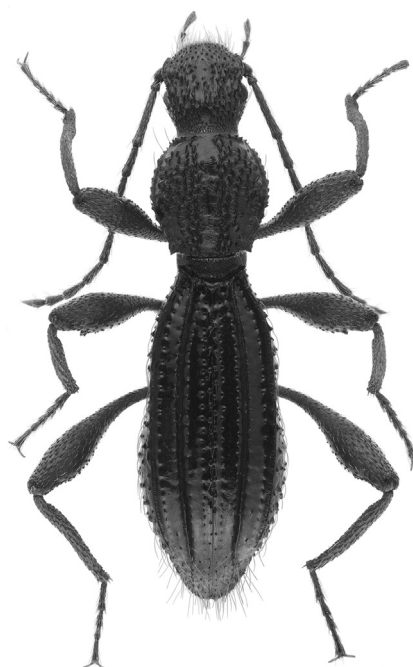


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Geographical records of six common ant species (Hymenoptera: Formicidae) in three climatic zones of Sri Lanka

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Abstract. Published geographical records of tramp species elsewhere, *Anoplolepis gracilipes* (F. Smith, 1857), *Solenopsis geminata* (Fabricius, 1804) and *Trichomyrmex destructor* (Jerdon, 1851), medically important *Odontomachus simillimus* F. Smith, 1858 and *Tetraponera rufonigra* (Jerdon, 1851), and mainly, a predator of insect pests, *Oecophylla smaragdina* (Fabricius, 1775) are listed and positioned on a Sri Lanka map for the first time, using Global Positioning System and an ArcGIS software. Future surveys are essentially required to fill the gaps due to less information in several districts.

Key words: localities of ants, medically important ants, native ants, Sri Lanka.

Географическое распределение шести наиболее обычных видов муравьев (Hymenoptera: Formicidae) в трех климатических зонах Шри-Ланки

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Резюме. Приведены данные о распространении на Шри-Ланке муравьев-бродяг, *Anoplolepis gracilipes* (F. Smith, 1857), *Solenopsis geminata* (Fabricius, 1804) и *Trichomyrmex destructor* (Jerdon, 1851), важных с медицинской точки зрения муравьев *Odontomachus simillimus* F. Smith, 1858 и *Tetraponera rufonigra* (Jerdon, 1851) и хищного муравья, регулирующего численность насекомых-вредителей, *Oecophylla smaragdina* (Fabricius, 1775). Местонахождения этих видов впервые нанесены на карту Шри-Ланки с использованием системы глобального позиционирования и программного обеспечения ArcGIS. Необходимы дальнейшие исследования, чтобы заполнить пробелы из-за недостаточного количества информации из нескольких округов.

Ключевые слова: местонахождения муравьев, важные с медицинской точки зрения муравьи, нативные виды муравьев, Шри-Ланка.

Introduction

Ants, a dominant and important insect group in terrestrial ecosystems [Davidson, Patrell-Kim, 1996] contribute to many ecological processes in the environment [Hölldobler, 1983; Drummond, Choate, 2011; Nepi et al., 2018; Del-Claro et al., 2019]. Stings of several myrmicine, ponerine and pseudomyrmecine species are painful and cause allergic reactions in humans [Levy et al., 1999; Potiwat, Sitcharungsi, 2015] and lead to the human death in Sri Lanka [Ratnatilaka et al., 2011].-

Globally, 16 subfamilies, 38 tribes, 346 genera and 14,112 extant species have been recorded, so far [Bolton, 2023], and 341 valid species in 79 genera and 10 subfamilies are reported from Sri Lanka [Dias et al., 2020].

A formicine species, *Anoplolepis gracilipes* (F. Smith, 1857) (long legged ant / yellow crazy ant) has been listed among the 100 most destructive invasive species in the world and occupies native ecosystems elsewhere [Lowe et al., 2000; Wetterer, 2005; Lee, Yang, 2022]. It usually makes populous, polydomous, polygynous supercolonies and preys on small invertebrates and extensively controls the populations of smaller vertebrates such as reptiles

and birds [Hill et al., 2003; Gerlach, 2004]. Protection of sap-sucking scales and aphids, which damage the forest canopy by *A. gracilipes* has been also reported [Lowe et al., 2000]. It is native to the Indomalayan biogeographical region and it occurs throughout Australasia, Malagasy, Nearctic, Neotropical, Oceania and Palaearctic regions also [Wetterer, 2005; Mezger, Pfeiffer, 2011; Sarnat, Economo, 2012; Borowiec, 2014; Ramage, 2014; Latumahina et al., 2015; Bharti et al., 2016; Fisher, Bolton, 2016; Jaitrong et al., 2016; AntWeb, 2021].

Solenopsis geminata (Fabricius, 1804) (tropical fire ant / red fire ant), a myrmicine ant, usually forms irregular soil nests [Dias, 2014] but sometimes rotten stumps are utilized as nesting sites. This is a predator of arthropods [Holway et al., 2002; Way, Heong, 2009] and a consumer of seeds [Tennant, Porter, 1991] in many disturbed ecosystems and its rapid spreading had affected other native ants [Risch, Carroll, 1982; Wetterer, 2011]. It is known as an ant pest and its stings are painful [Wetterer, 2011]. After the stinging, development of multiple yellowish-white pustules throughout the affected skin area of a child was reported in Sri Lanka, recently [Wijerathne et al., 2018]. This species is native to Nearctic and Neotropical biogeographical

regions (the southernmost part of North America and Central America) and it occurs throughout Afrotropical, Australasia, Indomalaya, Malagasy, Nearctic, Neotropical, Oceania and Palaearctic regions also [AntWeb, 2021].

Odontomachus simillimus F. Smith, 1858 (common oriental trap-jaw ant) is a ponerine, which nests in the soil, near the base of living trees, under stumps, rotten logs, rocks and under paved floors around houses. Nests are widely dispersed in gardens and green patches in residential zones, plantations, and secondary forests [Dias, 2011; Peiris, 2011; Ratnatilaka et al., 2011; Satria et al., 2015]. It is a medically important species because its stings caused severe anaphylaxis, which lead to a death [Ratnatilaka et al., 2011] in Sri Lanka. *Odontomachus simillimus* is native to Australasian (Australia, New Guinea, New Zealand, New Caledonia, and neighbouring islands, including the Indonesian islands from Lombok and Sulawesi eastward) and Indomalayan regions and recorded from Malagasy except Madagascar and Oceania [Fisher, Smith, 2008; AntWeb, 2021].

Oecophylla smaragdina (Fabricius, 1775) (Asian weaver ant or red/green weaver ant) is an aggressive and arboreal formicine species. The species is stingless but bites and sprays formic acid, which causes pain [Pierre, Idris, 2013]. They are active predators and they have an ability to protect host plants from phytophagous insects and other animals [Hölldobler, 1983; Tsuji et al., 2004]. It is native to Australasia and Indomalaya and recorded in the Oceania biogeographical region also [AntWeb, 2021].

Tetraponera rufonigra (Jerdon, 1851) (bi-coloured arboreal ant, "Hathpolaya" in Sri Lanka), an aggressive, large, predatory, pseudomyrmecine, nests in the cavities in dead and living wood in natural forests and human habitations in the tropical regions [Norasmah et al., 2012; Dias, Fernando, 2017]. Stings of the species are painful and may cause adverse medical conditions [Wanotayan et al., 2005; Potiwat, Sitcharungsi, 2015; Somala et al., 2020]. It is native to the Indomalayan region and occurs only on Seychelles in Malagasy region [Ward, 2001; Fisher, Bolton, 2016; AntWeb, 2021; Tetraponera..., 2023].

Trichomyrmex destructor (Jerdon, 1851) (destructive trailing ant) is a widespread, invasive, myrmecine species and a common household pest [Wetterer, 2015]. Colonies can be found in trees, in the soil, inside buildings, in potted plants, lawns, and irrigated fields [Wetterer, 2015]. It can cause a huge impact on the natural, agricultural and domestic habitats and destroy insulations of electric wires and electrical appliances while nesting [Wetterer et al., 2007; Wetterer, 2015]. The species is native to the Afrotropical region and also occurs throughout Australasia, Indomalaya, Malagasy, Nearctic, Neotropical, Oceania and Palaearctic regions [AntWeb, 2021].

Here, we present all existing geographical records of the above six species in Sri Lanka gathered from published articles in the locality map for each species.

Material and methods

Geographical records of six above-mentioned species were documented here by extracting relevant information

from the published locality records [Dias et al., 2001; Dias, Chaminda, 2002; Dias, 2003; Dias, Perera, 2006, 2007, 2009; Dias et al., 2020; AntWeb, 2021] and personal surveys conducted at the Department of Zoology and Environmental Management and Regional Centre for Asian Ant Research at University of Kelaniya, Sri Lanka. District names of each climatic zone were arranged in alphabetical order and all recorded localities of each species in each district were numbered arbitrarily. Using Global Positioning System and an ArcGIS software, geographical information of each species was positioned on the map of Sri Lanka.

Results

Geographical records of *Anoplolepis gracilipes* (Fig. 1). Distribution: it has been recorded from all climatic zones of Sri Lanka.

Wet zone. Colombo District: 1) Pelawatta in Battaramulla (personal communication); 2) Puwakpitiya [Forel, 1908]. Galle District: 3) Kuluna Kanda [Dias, Ruchirani, 2014]; 4) Point de Galle [Emery, 1887]. Gampaha District: 5) Aththanagalla [Sumanasinghe, Dias, 2002]; 6) Batuwatte, 7) Ganemulla, 8) Hunupitiya, 9) Kirindiwela, 10) Pilikuththuwa Forest, 11) Veyangoda, 12) Weligampitiya [Dias, Chaminda, 2002]; 13) Gampaha, 14) Kelaniya University premises [Dias et al., 2001; Dias, 2006]; 15) Udupila in Delgoda [Dias, Perera, 2016]; 16) Mahadarawa [Dias, Wickramasinghe, 2021]; 17) Buthpitiya, 18) Dekatana, 19) Keragala [Jayathilaka, 2017]; 20) Amithirigala [Dias et al., 2019]; 21) Dunagaha, 22) Minuwangoda, 23) Negombo, 24) Pallewela (personal communications). Kalutara District: 25) Kalutara (personal communication); Kandy District: 26) Peradeniya [Forel, 1911]; 27) Nawalapitiya [Amarasinghe, 2010]; Kegalle District: 28) Lenagala Forest Reserve [Dias, Udayakantha, 2019]. Matara District: 29) Weligama, 30) Wilpita Aranya Kele [Dias, Ruchirani, 2014]. Ratnapura District: 31) Ambilipitiya, 32) Balangoda, 33) Dumbaramana, 34) Eheliyagoda, 35) Godakawela, 36) Kuruwita, 37) Nivithigala, 38) Millavitiya [Dias, Perera, 2006, 2007, 2009]; 39) "Pompekelle" Forest [Dias, 2004]; 40) Gilimale Forest Reserve [Dias, Perera, 2011]; 41) Sinharaja Forest Reserve [Gunawardene et al., 2008]; 42) Udawalawe [AntWeb, 2021]; 43) Kalawana (personal communication).

Intermediate zone. Badulla District: 44) Dunhinda Falls [AntWeb, 2021]; Kurunegala District: 45) Badagamuwa Forest, 46) Bathalegoda, 47) Egodayagama, 48) Ibbagamuwa, 49) Kumbukwewa Forest, 50) Mawathagama uncultivated land, 51) Mawathagama banana cultivation, 52) Polgahawela [Peiris, 2012; Dias, Peiris, 2015]; 53) Mawathagama [Peiris, 2012]. Matale District: 54) Matale [Emery, 1893].

Dry zone. Ampara District: 55) Ampara, 56) Damana (personal communications); Anuradhapura District: 57) Mahailuppallama [Forel, 1913]; 58) Kahalle-Pallekele Forest, 59) Mihintale (uncultivated land), 60) Nachchaduwa Forest, 61) Pulliyarahandiya [Dias, Kosgamage, 2012]; 62) Anuradhapura Sanctuary, 63) Mihinthale Sanctuary, 64) Mihinthale teak plantation, 65) Namalwewa, 66) Nuwara

Wewa, 67) Rajarata University [Peiris, 2012; Dias, Peiris, 2015]. Batticaloa District: 68) Cashew Corporation, Batticaloa [Rickson, Rickson, 1998]; Polonnaruwa District: 69) Aluthwewa, 70) Athmalpitiya, 71) Dambulla Forest, 72) Ihakuluwewa, 73) Kalahagala Forest, 74) Polonnaruwa Sanctuary, 75) Nagapokuna, 76) Thambala [Peiris, 2012; Dias, Peiris, 2015]; 77) Giritale Forest, 78) Hathamuna, 79) Jayanthipura, 80) Minneriya, 81) Nikawewa, 82) Minneriya tank surrounding area, 83) Nagalakanda Forest, 84) Pulathisigama [Dias, Kosgamage, 2012]. Puttalam District: 85) Anawilundawa Forest, 86) Kalpitiya, 87) Madurankuliya, 88) Moragahakanda tank surrounding area, 89) Moragahakanda Forest (in Nawagaththegama) [Dias, Peiris, 2015].

Geographical records of *Solenopsis geminata* (Fig. 2). Distribution: it has been recorded from all climatic zones of Sri Lanka.

Wet zone. Colombo District: 1) Galagedara, 2) Padukka, 3) Pokunuwita [Dias, 2003]; Galle District: 4) Ambalangoda [Forel, 1909]; 5) Seenigoda [Forel, 1913]. Gampaha District: 6) Kelaniya University premises [Dias et al., 2001]; 7) Maimbula Forest [Dias, Chaminda, 2002]. Kandy District: 8) Nawalapitiya [Amarasinghe, 2010].

Intermediate zone. Kurunagala District: 9) Egodayagama, 10) Kumbukwewa Forest in Egodayagama, 11) Mawathagama [Dias, Peiris, 2015].

Dry zone. Anuradhapura District: 12) Kawarakkulama, 13) Mihinthale Forest, 14) Mihinthale uncultivated land, 15) Nachchaduwa Forest, 16) Pohoranwewa, 17) Thulana [Dias, Kosgamage, 2012]; 18) Anuradhapura Sanctuary, 19) Anuradhapura-teak plantation, 20) Rajarata University premises, 21) Mahakanadarawa Forest, 22) Mihinthale Sanctuary, 23) Mihinthale-teak plantation, 24) Namalwewa, 25) Nuwara Wewa [Peiris, 2012]. Polonnaruwa District: 26) Girithale Forest, 27) Hathamuna, 28) Jayanthipura, 29) Surrounding area of Minneriya tank, 30) Nagalakanda Forest, 31) Nikawewa, 32) Pulathisigama, 33) Sinhapura-vegetable field, 34) Somawathiya Sanctuary [Dias, Kosgamage, 2012]; 35) Aluthwewa, 36) Dambulla forest, 37) Kalahagala, 38) Nagapokuna, 39) Polonnaruwa Sanctuary, 40) Sinhapura uncultivated land [Peiris, 2012]. Puttalam District: 41) Anawilundawa Forest, 42) Kalpitiya, 43) Lunuwila, 44) Madurankuliya, 45) Marawila, 46) Moragahakanda Forest in Nawagaththegama, 47) Moragahakanda tank surrounding area, 48) Pallama [Peiris, 2012].

Geographical records of *Odontomachus simillimus* (Fig. 3). Distribution: it has been recorded from wet and intermediate zones of Sri Lanka. Surveys conducted in the dry zone never recorded the species.

Wet zone. Colombo District: 1) Indikada Mukalana Forest Reserve [Dias, Udayakantha, 2016a; Udayakantha, Dias, 2018]. Galle District: 2) Kuluna Kanda Forest [Dias, Ruchirani, 2014]. Gampaha District: 3) Batuwatta, 4) Pilikuththuwa, 5) Veyangoda, 6) Weligampitiya, 7) Kelaniya University premises, 8) Gampaha [Dias et al., 2001; Dias, Chaminda, 2002]; 9) Meethirigala Forest Reserve [Dias, Udayakantha, 2016b]; 10) Udupila in Delgoda [Dias, Perera, 2016]; 11) Mahadarawa [Dias, Wickramasinghe, 2021]; 12) Dunagaha, 13) Minuwangoda, 14) Negombo, 15) Pallewela (W.S. Udayakantha, personal

communication). Kalutara District: 16) Kalugala Kanda Forest [Dias, Ruchirani, 2014]; 17) Kirikanda Forest in Danawala [Dias et al., 2013]. Kandy District: 18) Peradeniya [Forel, 1913]; 19) Kandy [Karavaiev, 1925, 1926]. Kegalle District: 20) Lenagala Forest Reserve [Dias, Udayakantha, 2019]. Matara District: 21) Wilpita Aranya Kele [Dias, Ruchirani, 2014]. Ratnapura District: 22) Gilimale Forest Reserve [Dias, Perera, 2011]; 23) Malawa, 24) Kiriella [R.K.S. Dias, personal communication]; 25) Ambilipitiya, 26) Balangoda, 27) Dumbaramana, 28) Eheliyagoda, 29) Godakawela, 30) Kuruwita, 31) Nivithigala, 32) Millavitiya [Dias, Perera, 2007]; 33) Pompekelle Forest [Dias, 2014]; 34) Sinharaja Forest Reserve [Gunawardene et al., 2008]; 35) Ratnapura, 36) Kalawana (personal communication, [Satria et al., 2015]).

Intermediate zone. Kurunagala District: 37) Badagamuwa Forest, 38) Bathalegoda, 39) Polgahawela, 40) Mawathagama [Peiris, 2012; Dias, Peiris, 2015]. Matale District: 41) Bulanwala (in Dambulla) [Peiris, 2011].

Geographical records of *Oecophylla smaragdina* (Fig. 4). Distribution: it has been recorded from all climatic zones of Sri Lanka.

Wet zone. Colombo District: 1) Puwakpitiya [Forel, 1908]; 2) Kumbuka [Dias, Chaminda, 2002]; 3) Indikada Mukalana Forest Reserve [Dias, Udayakantha, 2016a; Udayakantha, Dias, 2018]; 4) Battaramulla (personal communication). Galle District: 5) Sinigoda [Forel, 1913]; 6) Ginimellagaha [Dias, 2003]. Gampaha District: 7) Kelaniya University premises [Dias et al., 2001]; 8) Attanagalla [Sumanasinghe, Dias, 2002]; 9) Pilikuththuwa, 10) Gampaha [Dias, Chaminda, 2002]; 11) Udupila in Delgoda [Dias, Perera, 2016]; 12) Divulpitiya, 13) Dunagaha, 14) Katana, 15) Minuwangoda, 16) Mirigama, 17) Negombo, 18) Pallewela, 19) Watinapaha (W.S. Udayakantha, personal communication). Kandy District: 20) Kandy [Emery, 1893]; 21) Nawalapitiya [Emery, 1893; Amarasinghe, 2010]; 22) Peradeniya [Forel, 1908, 1913]. Kalutara District: 23) Panadura [Rickson, Rickson, 1998]; 24) Kalutara (personal communication). Ratnapura District: 25) Balangoda, 26) Dumbaramana, 27) Godakawela, 28) Kuruwita, 29) Nivithigala, 30) Pompekelle, 31) Ratnapura [Dias, Perera, 2006; Dias, 2014]; 32) Sinharaja Forest Reserve [Gunawardene et al., 2008]; 33) Kalawana (personal communication).

Intermediate zone. Kurunegala District: 34) Kumbukwewa Forest (in Egodayagama), 35) surrounding area of Egodayagama tank, 36) Mawathagama [Peiris, 2012].

Dry zone. Ampara District: 37) Ampara, 38) Damana (personal communication). Anuradhapura District: 39) Pohoranwewa, 40) Pulliyarahandiya, 41) Thulana [Kosgamage, 2011; Dias, Kosgamage, 2012]; 42) Anuradhapura Sanctuary, 43) Mahakanadarawa, 44) Mihinthale Sanctuary, 45) Mihinthale teak plantation, 46) Namalwewa, 47) near Nuwara wewa teak plantation, 48) Rajarata University premises [Peiris, 2012; Dias, Peiris, 2015]. Polonnaruwa District: 49) Aluthwewa, 50) Ihakuluwewa, 51) Nagapokuna, 52) Polonnaruwa Sanctuary, 53) Thambala [Dias, Peiris, 2015]; 54) Jayanthipura, 55) surrounding area of Minneriya tank [Dias, Kosgamage, 2012]. Puttalam District:

56) Anawilundawa Forest, 57) Kalpitiya, 58) Lunuwila, 59) Marawila, 60) Madurankuliya, 61) Moragahakanda tank surrounding area (in Nawagaththegama), 62) Pallama [Dias, Peiris, 2015]; 63) Sri Lanka Cashew Corporation premises [Rickson, Rickson, 1998].

Geographical records of *Trichomyrmex destructor* (Fig. 5). Distribution: earlier, this species was known as *Monomorium destructor* (Jerdon, 1851) and it has been recorded from all climatic zones of Sri Lanka.

Wet zone. Gampaha District: 1) Buthpitiya, 2) Dekatana, 3) Keragala, [Jayathilaka, 2017]; 4) Kelaniya (R.K.S. Dias, personal communication). Kandy District: 5) Peradeniya [Dias et al., 2020]. Ratnapura District: 6) Sinharaja Forest Reserve [Gunawardene et al., 2008]; 7) Godakawela, 8) Balangoda, 9) Kuruwita, 10) Nivithigala [Dias, Perera, 2007].

Intermediate zone. Kurunegala District: 11) Egodayagama (coconut cultivation), 12) Polgahawela rubber cultivation [Dias, Peiris, 2015].

Dry zone. Anuradhapura District: 13) Mihintale, 14) Mihintale uncultivated land, 15) Pohoranwewa in Dambulla, 16) Thulana [Dias, Kosgamage, 2012]; 17) Anuradhapura Sanctuary, 18) Mihintale Sanctuary, 19) Mihinthale teak plantation, 20) Namalwewa, 21) Nuwara Wewa [Dias, Peiris, 2015]. Polonnaruwa District: 22) Minneriya tank surrounding area, 23) Sinhapura, 24) Somawathiya Sanctuary, 25) Thambala, 26) Athmalpitiya, 27) Dambulu Kele, 28) Ihakuluwewa, 29) Nagapokuna, 30) Polonnaruwa Sanctuary, 31) Sinhapura [Dias, Kosgamage, 2012]. Puttalam District: 32) Anawilundawa Forest, 33) Kalpitiya, 34) Lunuwila, 35) Madurankuliya, 36) Marawila [Peiris, 2012].

Geographical records of *Tetraponera rufonigra* (Fig. 6). Distribution: it has been recorded from all climatic zones in Sri Lanka.

Wet zone. Colombo District: 1) Battaramulla (personal communication); 2) Gatahatta (personal communication); 3) Park Road-Colombo 5, 4) Royal Colombo Golf Club, Colombo 8, 5) Vihara Maha Devi Park [Dias, Fernando, 2017]. Galle District: 6) Hikkaduwa [Ward, 2001]. Gampaha District: 7) Hunupitiya, Wattala, 8) Kapuwatta in Ja-Ela, 9) Kelaniya University premises, 10) Tyre Corporation Road in Kelaniya (R.K.S. Dias, personal observation, [Dias, Fernando, 2017]); 11) Ballapana, Minuwangoda, 12) Bemmulla, 13) Botanical Garden, Gampaha, 14) Ja-Ela, 15) Kandana, 16) Minuwangoda, 17) Negombo, 18) Pallewela, 19) Watinapaha, 20) Welisara (personal communications). Kalutara District: 21) Beruwala [Ward, 2001]; 22) Kalutara (personal communication). Nuwara Eliya District: 23) Pushparangnam Estate [Rickson, Rickson, 1998]. Ratnapura District: 24) Ratnapura, 25) Udawalawe, 26) Uggalkaltota [Ward, 2001]; 27) Pompekelle Forest Reserve [Dias, 2014]; 28) Kalawana [Ward, 2001].

Intermediate zone. Badulla District: 29) Dunhida Falls [Ward, 2001]. Kurunegala District: 30) surrounding area of Egodayagama tank, 31) Kumbukwewa in Egodayagama, 32) Mawathagama [Dias, Peiris, 2015]. Matale District: 33) Nalanda [Ward, 2001].

Dry zone. Ampara District: 34) Maha-Oya [Ward, 2001]. Anuradhapura District: 35) Medawachchiya [Ward, 2001]; 36) Nachchaduwa, 37) Pohoranwewa,

38) Pulliyarahandiya (uncultivated land) [Dias, Kosgamage, 2012]; 39) Anuradhapura Sanctuary, 40) Mahakanadarawa Forest, 41) Mihintale Sanctuary, 42) Namal Wewa [Dias, Peiris, 2015]. Hambantota District: 43) Hambantota, 44) Palatupana, 45) Yala National Park [Ward, 2001]. Jaffna District: 46) Jaffna [Ward, 2001]. Mannar District: 47) Paraiyanalankulam [Ward, 2001]. Monaragala District: 48) Monaragala [Ward, 2001]. Polonnaruwa District: 49) Medirigiriya [Ward, 2001]; 50) Nagalakanda Forest, 51) Minneriya Tank surrounding area, 52) Somawathiya Sanctuary, 53) Hathamuna, 54) Pulathisigama [Dias, Kosgamage, 2012]; 55) Polonnaruwa Sanctuary [Dias, Peiris, 2015]. Puttalam District: 56) Cashew corporation, West Sri Lanka [Rickson, Rickson, 1998]; 57) Lunuwila [Ward, 2001]; 58) Anawilundawa Forest in Chilaw, 59) Moragahakanda Forest in Nawagaththegama [Peiris, 2012]. Trincomalee District: 60) Kantale [Ward, 2001].

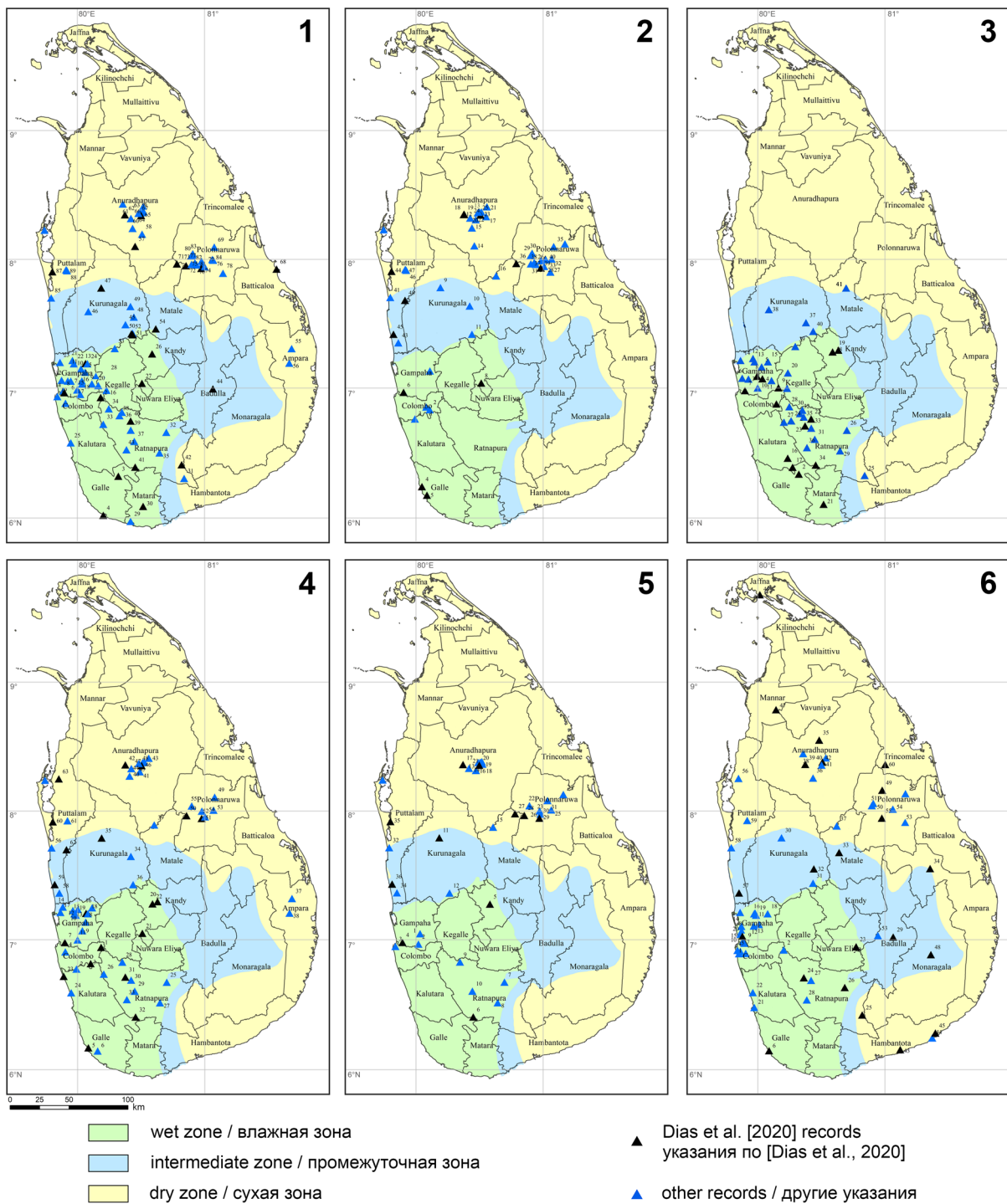
Discussion

The map of Sri Lanka showing the occurrence records of each ant species will be useful for future researches on any of them because the survey or the species collection can begin at the localities shown here. This is the first attempt of positioning the ant occurrence records on the Sri Lanka map, using an ArcGIS software.

Anoplolepis gracilipes was reported since 1887 and 1908 in urban areas [Emery, 1887; Forel, 1908] in Sri Lanka (formerly Ceylon). This species is native to Sri Lanka and first reported before 1887 [Anoplolepis..., 2023]. Recently, it was recorded from forests, cultivated and uncultivated lands in Ratnapura District [Dias, Perera, 2006, 2007, 2009], Sinharaja Forest Reserve [Gunawardene et al., 2008], Gillimale Forest Reserve [Dias, Perera, 2011] and Lenagala Forest Reserve [Dias, Udayakantha, 2019] in the wet zone of Sri Lanka. Hence, investigations on any effect of the species on fauna in each of those forest reserves are recommended prior to adding this to a list of invasive species in Sri Lanka.

The earliest record of *Solenopsis geminata* in Sri Lanka was in 1858 [Wetterer, 2011] and *Odontomachus simillimus* is native to the country; there is a single damaged *O. simillimus* queen from Sri Lanka (= Ceylon) which appears to be one of the original type-series, labelled "Ceylon. 50/56" at the British Museum of Natural History [Bolton, 2023]. Stings of *Odontomachus simillimus*, *Tetraponera rufonigra*, *Solenopsis geminata* and *Trichomyrmex destructor* have been reported to cause allergic reactions, anaphylaxis and death of humans in Sri Lanka [Ratnatilaka et al., 2011; de Silva et al., 2018; Premadasa et al., 2019] so that the maps on geographical records of each species will be helpful in the identification of the relevant species in such cases. Also, general public might be cautious on ant stings after knowing the presence of those ant species in their areas.

The earliest record of *Oecophylla smaragdina* [Wetterer, 2017] and *Trichomyrmex destructor*, a tramp species probably of Indian origin, in Sri Lanka (then Ceylon) was earlier than 1858; the latter represented by one worker was known as *Myrmica basalis* F. Smith [Trichomyrmex..., 2023]. The type locality of *Tetraponera rufonigra* is India [Bolton, 2023] and the first collection year of this species



Figs 1–6. Geographical records of six ant species in Sri Lanka.

Рис. 1–6. Географическое распределение шести видов муравьев в Шри-Ланке.

1 – *Anoplolepis gracilipes*; 2 – *Solenopsis geminata*; 3 – *Odontomachus simillimus*; 4 – *Oecophylla smaragdina*; 5 – *Trichomyrmex destructor*; 6 – *Tetraponera rufonigra*.

in Ceylon (currently, Sri Lanka) seems to be 1899 [Emery, 1901]. These species lived in Sri Lanka for centuries but their invasiveness has not been reported in the country yet.

Due to the lack of information, each map (Figs 1–6) shows that the six species were recorded rarely or not recorded from Hambantota, Ampara, Batticaloa,

Trincomalee, Vavuniya, Mannar, Killinochchi and Jaffna districts in the dry zone and Monaragala, Badulla and Matale districts in intermediate zone. Surveys for determining the presence or absence of each species should be conducted in those districts in the future to add the relevant geographical information.

Anoplolepis gracilipes invasion has many serious ecological consequences, especially for native invertebrate, vertebrate, and plant communities, altering ecosystem dynamics and functions [Lee, Yang, 2022]. Negative effects of any of the six species mentioned here on native ant species have never been focused in any research conducted in Sri Lanka but the highest mean nest density (rank 1) in quadrat sampling, the highest percentage frequency of worker occurrence (FWO%) in pitfall traps and FWO% in soil sifting of *A. gracilipes* were recorded from Lenagala Forest Reserve, Kegalle District in Sri Lanka indicating its dominance in the forest. The 2nd rank for the mean nest density and the second highest FWO% were observed for *Odontomachus simillimus* also [Dias, Udayakantha, 2019]. A common ponerine ant species *O. simillimus* was recorded from the Science Faculty premises of University of Kelaniya, Sri Lanka and it killed the termite, *Odontotermes ceylonicus* (Wasmann, 1902) in a laboratory experiment showing that it may play a significant role in the natural control of *O. ceylonicus* in the area [Wijerathna, Dias, 2012].

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