

New and Additional Records for the Ant Fauna (Hymenoptera, Formicidae) of Morocco

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ABSTRACT

Morocco hosts a high diversity of animal and plant species, including a diverse ant fauna. Here, we report collection records of four ant species not previously known from Morocco: *Gonomma kugleri* Espadaler, 1986, *Strumigenys rogeri* Emery, 1890, *Temnothorax longipilosus* (Santschi, 1912) and *Proceratium numidicum* Santschi, 1912. *G. kugleri* is mentioned for the first time for continental Africa. This raises the number of ant species known from Morocco to 242. In addition, we report new data on six ant species in Morocco for which there is little information: *Technomyrmex vexatus* (Santschi, 1919), *Temnothorax convexus* (Forel, 1894), *Messor brevispinosus* Santschi, 1923, *Strumigenys baudueri* (Emery, 1875), *Strumigenys membranifera* Emery, 1869 and *Monomorium andrei* Saunders, 1890. This number of ant species known from Morocco greatly exceeds from neighboring countries in North Africa. In addition, vast regions of Morocco have never been surveyed and probably host many undiscovered species.

Keywords: Ants, Biodiversity, *Gonomma kugleri*, Morocco, *Proceratium numidicum*, *Strumigenys rogeri*, *Temnothorax longipilosus*.

INTRODUCTION

Morocco possesses a diverse geography, from the highest mountains in Africa north of the Sahara to long coastlines on both the Atlantic Ocean and the Mediterranean Sea. Morocco's wide variety of climates have given rise to diverse ecosystems that are home to a high diversity of animal and plant species (ONEM, 2001).

Arthropods are the most diverse animal phylum in Morocco, with 17893 known species, constituting 73% of listed land animal species (SNCUDB, 2004). These include 13461 insect species, nearly 75% of the known arthropods (SNCUDB, 2004). The most recent published list of the ants of Morocco (Cagniant, 2006) includes 214 species, and subsequent studies have increased this number to 238 (Taheri & Reyes-López, 2015; 2018; Ajerrar, Gomez, Bouharroud, Zaafrani, & Cagniant, 2018; Seifert, 2020). Here, we report collection records of four ant species not previously known from Morocco, and six ant species for which there is interesting additional information about their natural history and distribution.

MATERIAL AND METHODS

Between 2014 and 2021, we sampled ants in three regions of Morocco : the northern Tangiers-Tetouan region (Talassemtane National Park, Bouhachem Natural Park, Atlantic coast of Tangier, Dardara, Jebha, Ksar El Majaz and Ksar El Kebir), central Morocco (Casablanca, Rabat and Maamora), and Marrakech city. The specimens were collected using an aspirator, through sifting leaf litter, and by soil washing.

Specimens were studied under a Leica S4D stereomicroscope and identified using available keys (Cagniant & Espadaler, 1997; Bolton, 2000; Barech, Khaldi, Espadaler, & Cagniant, 2017; 2020, Galkowski & Cagniant, 2017, Sharaf, Al Dhafer, & Aldawood, 2018), following the taxonomic nomenclature of Bolton (2023). The examined specimens were deposited in the insect collections of Chouaïb Doukkali University (AT collection, Morocco) and Cordoba University (JRL collection, Spain).

We presented the results as follows: AT-XXXX: # ♀, where AT-XXXX refers to the collection code of Ahmed TAHERI, and where # ♀, refers to # workers. This information is followed by the date, locality, GPS coordinates, altitude in meters above sea level and habitat.

RESULTS

We collected ten notable ant species in Morocco. Four are new records for the country (Figs. 1-5): *Goniomma kugleri* Espadaler, 1986, *Strumigenys rogeri* Emery, 1890, *Temnothorax longipilosus* (Santschi, 1912) and *Proceratium numidicum* Santschi, 1912, and six were rarely collected species with new data on the distribution and natural history: *Technomyrmex vexatus* (Santschi, 1919), *Temnothorax convexus* (Forel, 1894), *Messor brevispinosus* Santschi, 1923, *Strumigenys baudueri* (Emery, 1875), *Strumigenys membranifera* Emery, 1869, and *Monomorium andrei* Saunders, 1890.

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New records

Goniomma kugleri Espadaler, 1986

Material examined: AT-2341: 32 ♂, 01/11/2019, Bouhachem Natural Park, Tétouan. 35.2603, -5.4333, 1081 m., open area surrounding a peat bog, dominated by the *Cistus* spp. border of a *Q. suber* forest. AT-1031: 6 ♀, 15/01/2014, Atlantic coast of Tangier. 35.6988, -5.9096, 93 m, very degraded forest of *Quercus suber* L., 1753. AT-1034: 4 ♀, 15/01/2014, Atlantic coast of Tangier. 35.6988, -5.9096, 93 m, very degraded forest of *Q. suber*.

This Iberian endemic ant species was previously known solely from a few southern Spanish and Portuguese localities (Espadaler, 1985; Boieiro, Espadaler, Azedo & Serrano, 2002); its presence in the African continent was unknown. Based on our capture, the species' range is extended to the southern Mediterranean shore (Figs. 1, 5a).



Figure 1. Distribution map of *Goniomma kugleri* Espadaler, 1986. Green area = countries where the species is cited as native, blue circle = new records.

Strumigenys rogeri Emery, 1890

Material examined: AT-2700: 1 ♀, 30/06/2021, Forest of Maamora, Khémisset. 34.0193, -6.5815, 175 m, cork oak forest.

S. rogeri is native to tropical Africa, but has spread through with human commerce to many parts of the globe (Wetterer, 2012). It occurs in Africa, Americas, Asia, Europe, and Oceania (Wetterer, 2012). There are no reports from the North African countries nor in the Mediterranean Basin (Borowiec, 2014; AntWeb.org) (Figs. 2, 5b). It constitutes the sixteenth known invasive ant species in Morocco, and the seventeenth in all the Maghrebian countries (Taheri & Reyes-López, 2018, Oussalah, Marniche, Espadaler, & Biche, 2019). The species was captured in a natural habitat, 100 m from the road, in the largest cork oak forest in the world.

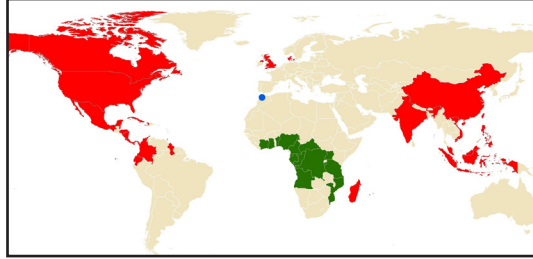


Figure 2. Distribution map of *Strumigenys rogeri* Emeryi, 1890. Green area = countries where the species is cited as native, red area = countries where the species is cited as non-native, blue circle = new record.

***Proceratium numidicum* Santschi, 1912**

Material examined: AT-2701: 1 ♂, 04/04/2021, Bouhachem Natural Park, Beni Layeth, Tétouan. 35.258470, -5.418806, 992 m, cork oak forest with a dense undergrowth of *Arbutus unedo* L., 1753, *Erica arborea* L., 1753, *Pistacia lentiscus* L., 1753, *Cistus crispus* L., 1753 and *Cistus monspeliensis* L., 1753.

Very little is known about the biology of this species. Its known distribution is very scattered across several countries of the southern and eastern Mediterranean (Antmaps.org) (Figs. 3, 5c). But given the general rarity of all species in this genus, much remains to be discovered.

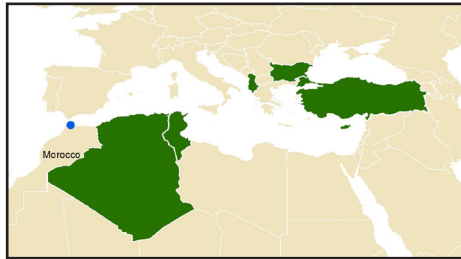


Figure 3. Distribution map of *Proceratium numidicum* Santschi, 1912. Green area = countries where the species is cited as native, blue circle = new record.

***Temnothorax longipilosus* (Santschi, 1912)**

Material examined: AT-0974: 4 ♂, 13/06/2013, Bouhachem Natural Park, Dardara, Chefchaouen. 35.1059, -5.2995, 484 m, *Q. suber* forest with thick, tall understorey of *Erica arborea* L., 1753, *Cistus crispus* L., 1753, *Cistus monspeliensis* L., 1753 and *Arbutus unedo* L., 1753, adjacent to an open area with low scrub of *C. crispus* and some grassy clearings. AT-0976: 1 ♂ and AT-0977: 3 ♂ (same data as AT-0974).

Santschi (1912) described this species from two workers from Le Kef, Tunisia. Our record from Morocco is the only additional record of this species (Figs. 4, 5d). This rediscovery was presented in a poster at the 11th Iberian Congress of Myrmecology (Reyes-López & Taheri, 2016), but without including any data about the material collected nor the exact coordinates.

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Figure 4. Distribution map of *Temnothorax longipilosus* (Santschi, 1912). Green area = countries where the species is cited as native, blue circle = new record.

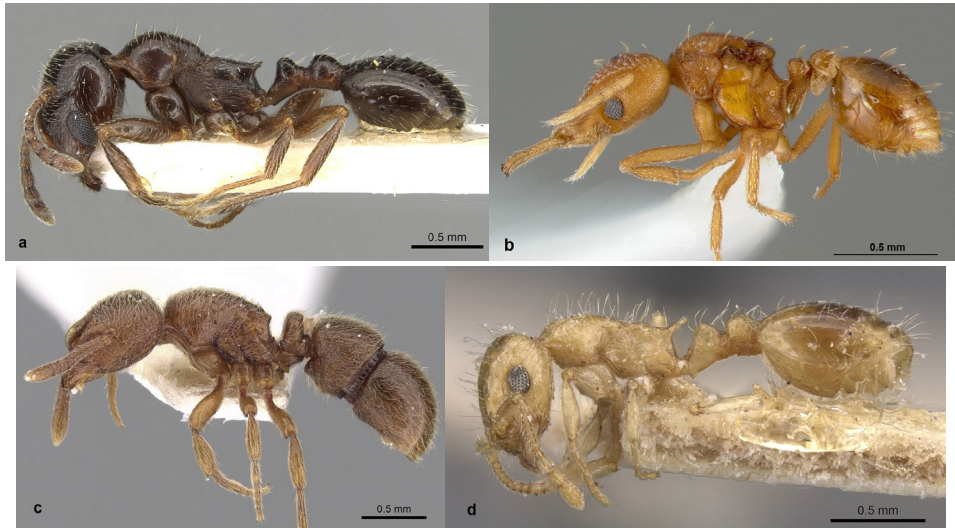


Figure 5. Profile view of a) *Goniomma kugleri*, photo by Zach Lieberman, AntWeb.org (CASENT0915447); b) *Strumigenys rogeri*, photo by April Nobile, AntWeb.org (CASENT0006035); c) *Proceratium numidicum*, photo by Estella Ortega, AntWeb.org (CASENT0281855) and d) *Temnothorax longipilosus*, photo by Will Ericson, AntWeb.org (CASENT0912959).

New Data on Distribution and Natural History

Technomyrmex vexatus (Santschi, 1919)

Material examined: AT-0709, 5 ♀, 31/08/2012, Zaouiyat sidi Kassem, Tamrabat, Tetouan, 35.5322, -5.1916, 88 m, reforested pine forest. AT-2293, 20 ♀, 23/10/2019, Jebha, Chefchaouen, 35.1656, -4.6315, 757 m, reforested pine forest on a scrub of *Q. ilex* and *P. lentiscus*.

Technomyrmex vexatus was originally described from Tangier in north Morocco, based on a male (Santschi, 1919). It was subsequently reported from Ceuta by Cagniant & Espadaler (1993) as *Technomyrmex* sp., but later confirmed as *T. vexatus* (Guillem & Bensusan, 2008). The species was omitted in the latest list of Moroccan ants (Cagniant, 2006), which had only mentioned *Technomyrmex* sp 1 (not determined with certainty) located in Tetouan (north Morocco) and Ceuta (Spain). In Europe, it

was recorded twice; in Gibraltar (Guillem & Bensusan, 2008) and in Spain (Guillem & Bensusan, 2019). It is also newly recorded from Yemen and the Arabian Peninsula (Sharaf et al., 2018). It seems that the species exploits thick maquis as a habitat on both sides of the Strait of Gibraltar. In Morocco, these maquis have recently been reforested with *Pinus halepensis* Mill., 1768. Nests have been found in dead branches of *P. lentiscus*, in the ground, and on trees in Europe (Guillem & Bensusan, 2008; Guillem & Bensusan, 2019). In Morocco, all the colonies were found under stones. It should be noted that there are two other Tertiary relict ant species that have a similar ecology and natural history as *T. vexatus*: *Anochetus ghilianii* (Spinola, 1951) and *Stigmatomma emeryi* (Saunders, 1890). The status of *A. ghilianii* was clarified by Jowers, Taheri, & Reyes-López (2015) following a genetic approach; it is not a native species in Europe, but a recent introduction from North Africa, possibly via maritime traffic between ports on either side of the Strait of Gibraltar. In the absence of a genetic study, the hypothesis of an accidental introduction of *T. vexatus* from northern Morocco into Spain still remains possible.

***Temnothorax convexus* (Forel, 1894)**

Material examined: AT-1454, 7 ♀, 27/04/2017, Ryade El Ouchak, Tetouan, 35.5673, -5.3687, 63 m, public garden.

This species was originally described as *Leptothorax convexus* from workers captured in northern Algeria in M'Sila cork oak *Quercus suber* forest. Few published records exist. In Morocco, it is only known from Tangier (= *L. submuticus* Emery, 1915 and *L. convexus* var. *timida* Santschi, 1912). In their revision of the *Temnothorax angustulus* group, to which this species belongs, Galkowski & Cagniant (2017) state that *T. convexus* has not been collected again either in Morocco or in Algeria since the description of it and of its junior synonym. Recently, the species has been reported in southern Iberia in Gibraltar, and in the Spanish province of Cadiz (Guillem & Bensusan, 2019). Our findings confirm that it also inhabits the Rif area in Morocco.

***Messor brevispinosus* Santschi, 1923**

Material examined: AT-2343, 19 ♀, 19/07/2019, Talassemrane National Park, Chefchaouen. 35,1738, -5,1390, 1520 m, riverside, degraded area.

The workers we examined correspond to *Messor foreli brevispinosus* Santschi, 1923 described from the Atlantic coast of the Sahara (*sensu* Cagniant & Espadaler, 1997) with a shorter and straight propodeal spine. Currently, this species is only known from Atlas Saharien Oranais in Algeria and from the south of Agadir to Tan-Tan along the Atlantic coast. Our record from Talassemrane National Park (Chefchaouen) indicates that this species also exists in the Rif area in the north of the country.

***Strumigenys baudueri* (Emery, 1875)**

Material examined: AT-1041, 28 ♀, 13/08/2014, Ain Chouka, Ksar El Majaz, Fahs-Anjra, 35.8289, -5.5481, 162 m, open scrub dominated by *P. lentiscus*. AT-0810, 1 ♀, 15/01/2013, Akerrat forest, Dardara, Chefchaouen. 35.1173, -5.2907, 490 m, dense cork oak forest.

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The species is recorded in all Mediterranean countries except those in the southeast (Borowiec, 2014; Antmaps.org). In Morocco, it has been reported once in Agadir, fallen in a pool (Bolton, 2000; Cagniant, 2006), and once in the Rif, extracted from a soil sample (Taheri & Reyes-López, 2015). Its cryptic lifestyle (Braschler, 2002; Marko, 2008) makes it difficult to be detected. The capture of these kinds of subterranean ants requires specific methods (Wong & Guénard, 2017). Here, we have used the “washing soil” technique developed by Normad (1911) for the capture of endogenous beetles. Thanks to this method, several species of ants, qualified as rare (Cagniant, 2006), have been recently collected in Morocco. In particular the genera of *Hypoponera*, *Leptanilla*, *Proceratium*, *Ponera*, *Solenopsis*, *Stenamma* and *Strumigenys* (unpublished data).

***Strumigenys membranifera* Emery, 1869**

Material examined: AT-1946, 2 ♀, 16/07/2018, Forest of Maamora, Salé. 34.0193, -6.7183, 124 m, cork oak forest.

This species of Afrotropical origin was distributed worldwide through commerce and human activities (Wetterer, 2011). It has successfully established in a wide range of habitats including forests, cultivated fields, pastures, and even manicured gardens and lawns (Deyrup, 1997). Its first discovery in Morocco beginning in 2011 (Taheri & Reyes-López, 2011; Taheri & Reyes-López, 2018). In all cases, the records were from urban areas. The importance of our discovery is that this species has been recorded for the first time in a natural habitat which is the largest cork oak forest in the world. It should also be noted that the forest area where the species has been found is heavily frequented by families for entertainment. Moreover, a continuous urbanization expansion is also remarkable such as: the construction of sports complexes, roads and gardens, which can probably explain the introduction of this tramp species.

***Monomorium andrei* Saunders, 1890**

Material examined: AT-1514: 1 ♀, 17/04/2017, Ksar El Kebir, 35.0095, -5.9068, 11 m, AT-1527: 3 ♀, 17/04/2017, Ksar El Kebir, 34.9972, -5.9117, 16 m, public garden. AT-1311: 1 ♀, 13/04/2017, Mnar, Marrakech, 31.6183, -8.0084, 466 m, public garden. AT-1520: 8 ♀, 17/04/2017, Ksar El Kebir, 34.9964, -5,9135, 12 m, urban area.

The species is known in the western Mediterranean region: Algeria, Gibraltar, Spain (including Balearic Islands), and Lebanon (Borowiec, 2014; Tohmé & Tohmé, 2014). In Algeria, two subspecies can be distinguished: *M. a. bernardi* Ettershank, 1966 in Tassili and *M. a. fur* Forel, 1894 in Oran (Barech et al, 2017). In Morocco, the species was recently captured for the first time, in an oasis in the south of the country (Taheri, El Mahroussi, Reyes-López, Bennis & Brito, 2021). So far, it was only detected in human-disturbed areas and could be considered as an introduced species. In Marrakech, it was collected using the sifting leaf litter method and in Ksar El Kbeir by pitfall trap.

CONCLUSION

The number of ant species known from Morocco has increased from 214 species in 2006 (Cagniant, 2006) to 242 with the data presented here. This number greatly exceeds that of ants in neighboring countries, estimated at 180 species in Algeria and Tunisia combined (Cagniant, 2006). The number of exotic ant species known has been steadily increasing (Taheri and Reyes-López, 2018). In addition, vast regions of Moroccan Sahara and in the Atlas Mountains have never been surveyed and probably host many undiscovered species.

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REFERENCES

- Ajerrar, A., Gomez, K., Bouharroud, R., Zaafrani, M., & Cagniant, H. (2018). *Temnothorax tamriensis* nouvelle espèce de Fourmi du Maroc. *Revue de l'Association Roussillonnaise d'Entomologie*, XXVII (2), 97-107.
- Antmaps. (2022, Decembre 4). Overall species richness. Retrieved from www.antmaps.org.
- AntWeb. (2022, Decembre 4). California Academy of Science. Retrieved from <https://www.antweb.org>.
- Barech, G., Khaldi, M., Espadaler, E., & Cagniant, C. (2020). Révision taxonomique du genre *Messor* (Hymenoptera, Formicidae) au Maghreb et description de *Messor hodnii* sp. n., une nouvelle espèce de fourmi trouvée en Algérie. *Revue suisse de Zoologie*, 127(1), 9-19.
- Barech, G., Khaldi, M., Espadaler, X., & Cagniant, H. (2017). Le genre *Monomorium* (Hymenoptera, formicidae) au Maghreb (Afrique du nord): clé d'identification, avec la redescription de la fourmi *Monomorium major* Bernard, 1953 et nouvelles citations pour l'Algérie. *Boletín de la Sociedad Entomológica Aragonesa*, 61: 151-157.
- Baroni Urbani, C. (1968). Studi sulla mirmecofauna d'Italia. IV. La fauna mirmecologica delle isole Maltesi ed il suo significato ecologico e biogeografico. *Annali del Museo Civico di Storia Naturale*, 77, 408-559.
- Boieiro, M., Espadaler, X., Azedo, A.R., & Serrano, M. (2002). Four new species to the ant fauna of Portugal (Hymenoptera, Formicidae). *Boletim da Sociedade Portuguesa de Entomologia*, 7(20), 253-259.
- Bolton, B. (2000). The ant tribe Dacetini. *Memoirs of the American Entomological Institute*, 65, 1-1028.
- Bolton, B. (2023, January 10). An online catalogue of the ants of the world. Retrieved from <http://antcat.org>.
- Borowiec, L. (2014). Catalogue of ants of Europe, the Mediterranean Basin and adjacent regions (Hymenoptera: Formicidae). *Genus (Wroclaw)*, 25(1-2), 1-340.
- Braschler, B. (2002). Neue Aspekte zur Verbreitung von *Pyramica baudueri* (Emery, 1875) (Hymenoptera, Formicidae). *Mitteilungen der Entomologische Gesellschaft Basel*, 52(4), 139-142.
- Cagniant, H. & Espadaler, X. (1993). Liste des especes de fourmis du Maroc. *Actes des Colloques Insectes Sociaux*, 8, 89-93.
- Cagniant, H. & Espadaler, X. (1997). Les *Leptothorax*, *Epimyrma* et *Chalepoxenus* du Maroc (Hyménoptera : Formicidae). *Clé et catalogue des espèces. Annales de la Société Entomologique de France (N.S.)*, 33(3), 259-284.

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- Cagniant, H. (2006). Liste actualisée des fourmis du Maroc. *Myrmecological Nachrichten*, 8, 193-200.
- Cagniant, H. 2009. Liste du genre *Cataglyphis* Foerster, 1850 au Maroc (Hymenoptera: Formicidae). *Orsis*, 24, 41-71.
- De Haro, A. & Collingwood, C. A. (1997). Prospección mirmecológica por la península Tingitana al norte del Rif (Marruecos). *Orsis*, 12, 93-99.
- Deyrup, M. (1997). Dacetine ants of the Bahamas (Hymenoptera: Formicidae). *Bahamas Journal of Science*, 5, 2-6.
- Espadaler, X. (1985). *Goniomma kugleri*, a new granivorous ant from the Iberian Peninsula (Hymenoptera: Formicidae). *Israel Journal of Entomology*, 19, 61-66.
- Galkowski, C. & Cagniant, H. (2017). Contribution à la connaissance des fourmis du groupe "angustulus" dans le genre "*Temnothorax*" (Hymenoptera, Formicidae). *Revue de l'Association Roussillonnaise d'Entomologie*, 26(4), 180-191.
- Goetsch, W. (1942). Beiträge zur Biologie spanischer Ameisen. *Revista Española de Entomología*, 18, 175-241.
- Guillem, R. & Bensusan, K. (2008). *Technomyrmex vexatus* (Santschi, 1919) from Gibraltar (Hymenoptera: Formicidae): A new ant species for Europe and genus for Iberia. *Myrmecological News*, 11, 21-23.
- Guillem, R. & Bensusan, K. (2019). Two new species of ants (Hymenoptera: Formicidae) for Europe from southern Iberia. *Revista de la Sociedad Gaditana de Historia Naturali*, 13, 5-10.
- Jowers, M.J., Taheri, A. & Reyes-López, J. (2015). The ant *Anochetus ghilianii* (Hymenoptera, Formicidae), not a Tertiary relict, but an Iberian introduction from North Africa: Evidence from mtDNA analyses. *Systematics and Biodiversity*, 13(6), 865–874.
- Markó, B. (2008). *Pyramica baudueri* (Emery, 1875) - a new ant species (Hymenoptera: Formicidae) for the Romanian fauna. *Fragmenta Faunistica*, 51(2), 101-106.
- Nornand, H. (1911). Description d'un nouveau procédé de capture de Coléoptères hypogés. *L'Echange*, 315, 114-116 & 124-126.
- ONEM. (2001). *Etude nationale sur la biodiversité*. Rapport de synthèse. Département de l'environnement, Maroc.
- López, J.R. & Taheri, A. (2016). Relación provisional de los formicidos del Proyecto del Parque Natural Regional de Bouhachem (Marruecos). *Iberomyrmex*, 8, 35-36.
- Paknia, O., Radchenko, A., Alipanah, H., & Pfeiffer, M. (2008). A preliminary checklist of the ants (Hymenoptera: Formicidae) of Iran. *Myrmecological News*, 11, 151-159.
- Oussalah, N., Marniche, F., Espadaler, X. & Biche, M. (2019). Exotic ants from the Maghreb (Hymenoptera, Formicidae) with first report of the Hairy Alien Ant *Nylanderia jaegerskioeldi* (Mayr) in Algeria. *Arxius de Miscellània Zoològica*, 17, 45-58.
- Salata, S., Karaman, C., Kiran, K. & Borowiec, L., 2021. Review of the *Aphaenogaster splendida* species-group (Hymenoptera: Formicidae). *Annales Zoologici*, 71, 297-343. <https://doi.org/10.3161/0034541ANZ2021.71.2.008>
- Santschi, F. (1912). Nouvelles fourmis de Tunisie récoltées par le Dr. Normand. *Bulletin de la Société d'Histoire Naturelle de l'Afrique du Nord*, 3, 172-175
- Santschi, F. (1919). Fourmis du genre *Bothriomyrmex* Emery. (Systématique et moeurs.). *Revue Zoologique Africaine*, 7, 201-224.
- Seifert, B. (2020). A taxonomic revision of the Palaearctic members of the subgenus *Lasius* s.str. (Hymenoptera, Formicidae). *Soil Organisms*, 92(1), 15-86. <https://doi.org/10.25674/so92iss1pp15>
- Sharaf, M.R., Al Dhafer, H.M., & Aldawood, A.S. (2018). Review of the ant genus *Technomyrmex* Mayr, 1872 in the Arabian Peninsula (Hymenoptera, Formicidae). *ZooKeys*, 780, 35-59
- SNCUDB. (2004). *Stratégie nationale pour la conservation et l'utilisation durable de la diversité biologique*. Ministère de l'Aménagement du territoire, de l'eau et de l'Environnement, 125 pp.

- Taheri, A. & Reyes-López, J. (2015). Five new records of ants (Hymenoptera: Formicidae) from Morocco. *Journal of Insect Science*, 15(1), 37.
- Taheri, A. & Reyes-López, J. (2018). Exotic Ants (Hymenoptera: Formicidae) in Morocco: Checklist, Comments and New Faunistic Data. *Transactions of the American Entomological Society*, 144(1), 99-107.
- Taheri, A., El Mahroussi, M., Reyes-López, J., Bennis, N., & Brito, J. (2021). Ants invading deserts: non-native species in arid Moroccan oases. *Journal of Arid Environments*, 184, 1-5.
- Taheri, A., Reyes-López, J., & Bennis, N. (2014). Contribution à l'étude de la faune myrmécologique du Parc National de Talassemtane (Nord du Maroc): biodiversité, biogéographie et espèces indicatrices. *Boletín de la Sociedad Entomológica Aragonesa*, 54, 225-236.
- Tohmé, G. & Tohmé, H. (2014). Nouvelle liste des espèces de fourmis du Liban (Hymenoptera, Formicoidea). *Lebanese Science Journal*, 15(1), 133-141.
- Wetterer, J.K. (2011). Worldwide spread of the membraniferous dacetine ant, *Strumigenys membranifera* (Hymenoptera: Formicidae). *Myrmecological News*, 14, 129-135.
- Wetterer, J.K. (2012). Worldwide spread of Roger's dacetine ant, *Strumigenys rogeri* (Hymenoptera: Formicidae). *Myrmecological News*, 16, 1-6.
- Wong, M.K.L. & Guénard, B. (2017). Subterranean ants: summary and perspectives on field sampling methods, with notes on diversity and ecology (Hymenoptera: Formicidae). *Myrmecological News*, 25, 1-16.