

**FIRST REPORT IN SYRIA OF TWO PREDATORY TRUE BUGS:  
*MONTANDONIOLA INDICA* (HEMIPTERA: ANTHOCORIDAE)  
AND *GEOCORIS AMABILIS* (HEMIPTERA: GEOCORIDAE)**

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ABSTRACT: In this study, two heteropterous species *Montandoniola indica* Yamada, 2011 (Heteroptera: Anthocoridae) and *Geocoris amabilis* Stål, 1855 (Heteroptera: Geocoridae) were detected on the leaves of *Ficus benjamina* plants, in the coastal area in Tartous, Syria. Adults and a nymph of *M. indica* were collected, on heavy infested leaves with *Gynaikothrips uzeli* Zimmermann, 1900 (Thysanoptera: Phlaeothripidae). This is the first record of the both bugs in Syria and the first detection of *M. indica* outside India.

KEY WORDS: *Montandoniola indica*, *Geocoris amabilis*, Anthocoridae, Geocoridae, *Gynaikothrips uzeli*, *Ficus benjamina*, Syria

Although catalogs of the Palaearctic Anthocoridae and Lygaeidae were published (Péricart, 1996; Péricart, 2001; Aukema et al., 2013) as well as a faunal list by El-Hariri (1971) which is completion based on Stichel (1955-1962), no specific study has been devoted to Syrian Heteroptera and this rich fauna remains poorly known.

By studying the weeping fig thrips *Gynaikothrips uzeli* (Zimmermann, 1900) (Thysanoptera: Phlaeothripidae), recently introduced in Syria where it appears to be successfully adapted (Ali 2014), we have collected two interesting species of predators: one of the genus *Montandoniola* (Anthocoridae: Anthocorinae: Oriini), the other of the genus *Geocoris* (Geocoridae: Geocorinae). In Syria, there is no report about the presence of species belonging to genus *Montandoniola*. Several species of *Geocoris* are reported by Péricart (2001) from Syria: *G. chloroticus* Puton, 1888, *G. anticus* Péricart, 1994, *G. ater* Fabricius, 1787, *G. fedtschenkoi* Reuter, 1885, *G. hispidulus* Puton, 1874, *G. lineola* Rambur, 1839, *G. megacephalus* Rossi, 1790, *G. nebulosus* Montando, 1907 but none of them correspond to our specimens.

## MATERIAL AND METHODS

Infested leaves of *Ficus benjamina* L. (Moraceae) including the thrips species *G. uzeli* and the bug species *Montandoniola* sp. were collected during August 2017 at Wadi-Al Shatter location (34° 51' 50.60", 35° 53' 46.48") in Tartous Governorate. While, the Curled leaves of *F. benjamina* including *Geocoris* sp. bugs were sampled during February 2017 at Al -Jemaseh location (34° 44' 0.74", 35° 58' 39.64") also in Tartous Governorate. The bugs were removed using a fine brush and preserved in 95% alcohol. 21 *Montandoniola* and 3 *Geocoris* sp. Bugs were send to INRA-CBGP (Montpellier) and 30 specimens of genus *Montandoniola* and 10 specimens of genus *Geocoris* were deposited at the

Laboratory of Entomology in the Center of Tartous for Agricultural Research and identified.

Identification of *Montandoniola* was performed using recent publications especially new descriptions. Male and female genitalia were dissected after a maceration in a KOH 10% solution. Observations were performed under a stereomicroscope Leica DM205C and a microscope Leica DLMB, and some pictures were also sent to Prof. Yamada K. (Japan) for verification. We tried to identify the *Geocoris* using the Fauna of France (Péricart, 1998) but as our species was not included in this book we used the collections of Heteroptera of the Centre International en Recherche Agronomique pour le Développement (CIRAD – CBGP, Montpellier, France) and those of Museum National d'Histoire Naturelle (MNHN, Paris).

## RESULTS AND DISCUSSION

### *Montandoniola indica* (Yamada, 2011)

(Figs. 1, 3-4)

Our specimens correspond exactly to the description of *M. indica* Yamada, 2011. We sent photographs of the male and female habitus and genitalias to Prof. Yamada Y. who confirmed the similarity (Figs. 1, 3-4). It is the first record of a *Montandoniola* species in Syria. Species belonging to this genus are known as predators of economically important thrips. Before Pluot-Sigwalt et al. (2009), most species of *Montandoniola*, and especially those used for biological control were merged under the name *M. moraguesi*. It follows that it is not currently possible to know which species refers to publications prior to 2009. This is particularly the case of the *Montandoniola* species studied by Muraleedharan & Ananthakrishnan (1971, 1978) in India. *G. uzeli* is an invasive species in Syria, probably introduced with horticultural trade in *F. benjamina* (Ali, 2014), that could have been transported with its natural enemies. It is native from Southeast Asia including Taiwan, China, and India (Mound et al., 1995; Held et al., 2005). In such a context we did not know which species of *Montandoniola* to expect.

*M. indica* is an efficient predator of gall-forming thrips, *Liothrips karnyi* Bagnall, 1924 (Thysanoptera: Phlaeothripidae), infesting black-pepper leaves in India (Yamada et al., 2011). Our knowledge on this species is very limited; it has never been reported since its description. More generally, Anthocoridae, even when they play an important role in pests' regulations, are very poorly known. The distribution of *M. indica* is potentially much wider than the only localities reported by Yamada et al. (2011). It is currently impossible to know whether it originates from Syria or is introduced, in particular because unintentional introduction by *G. uzeli* infected material is possible. Only further faunistic studies between Syria and India will make possible to decide on the origin of the Syrian population.

### *Geocoris (Geocoris) amabilis* (Stål, 1855)

(Fig. 2)

Our specimens (Fig. 2) were identified by comparison with reference material preserved in Montpellier (CIRAD collection) and Paris (MNHN collection). They match well with the species *G. amabilis*. This species was not reported from Syria nor northern to Sahara.

The *Geocoris* species are known as generalist predators (Sweet, 2000). *G. amabilis* is a poorly known species although common and widespread in tropical Africa. Several subspecies have been described: *G. amabilis blandulus*

Montandon, 1907 from Ethiopia, *G. amabilis pictipes* Bolivar, 1879 from Congo, Ethiopia and Somalia. The species is cited unspecified as subspecies from Congo, Guinea, French Sudan (Mali), Natal, Nigeria, Rwanda, South Africa, Sudan, Uganda (Slater, 1964), Ivory Coast, Ghana, Liberia, Senegal, (Heinrichs & Barrion, 2004), and Somalia (Linnavuori, 1982). The online catalogue "Lygaeoidea Species File" (Dellapé & Henry, 2018) does not give more details.

We have examined specimens from the following countries: Central African Republic, Benin (MNHN general collection), Cameroun, Chad (MNHN, Péricart collection), Burkina Faso (Streito J.C. collection, Montpellier, France), Benin, Togo, Mali, Congo Brazzaville (CIRAD collection). This species is known as predator in cotton fields (Renou & Brévault, 2015; Couilloud, 1989) and Rice (Heinrichs & Barrion, 2004) in Western Africa. We didn't find anything else on its biology.

Both species are predators and were not reported before from Syria. These reports extend greatly known distributions of these true bugs. It is possible that our faunistic knowledge of Heteroptera is too incomplete and that in fact both species are more widespread than expected. This is particularly the case for *M. indica* described very recently and confused for years with *M. moraguesi*. *G. amabilis* is, however, a long known species whose taxonomy has so far been fairly stable and it is surprising that it has never been reported from the Near-East by the authors who have prospected the region, notably R. Linnavuori. Moreover, recent catalogues published from neighboring countries do not mention this species either Linnavuori et al. (2014) for United Arab Emirates; Ghahari & Moulet (2012) for Iran; Kiyak et al. (2004), Matocq & Özgen (2010), Matocq et al. (2014) for Turkey. Under these conditions it is not excluded that *G. amabilis* but perhaps also *M. indica* have recently arrived in Syria, either naturally favored by climate changes, or via exchanges of plants, goods or transport of passengers.

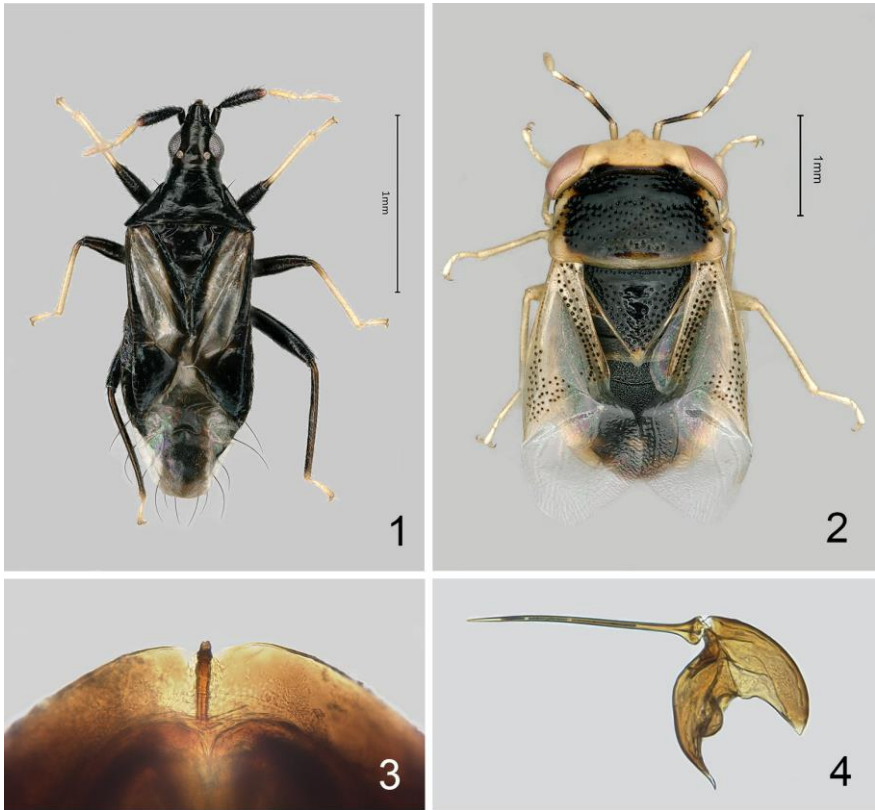
These two species could be of interest for biological control. *G. amabilis* is badly known, but it is a polyphagous predator that can be found on many crops and natural environments. If it becomes established in agrosystems on a long-term basis it is likely to play a potentially important role. *M. indica*, as probably most if not all *Montandoniola* species, is specialized in thrips predation. Yamada et al. (2011) showed that eggs, all nymphal instars and adults of *M. indica* were found within the leaf curl galls induced by the thrips, *Liothrips karnyi* on the black pepper leaves, *Piper nigrum* (Piperaceae). Adults and nymphs of *M. indica* were collected, inside the galls induced by the thrips *G. uzeli* on *F. benjamina* in Tartous governorate, that means the thrips species *G. uzeli* is considered as prey for this anthocorid bugs. Yamada et al. (2011) demonstrated that *M. indica* is an efficient predator of gall-forming thrips, *L. karnyi*, therefore *M. indica* could reduce the population of the thrips species *G. uzeli* but further experiments especially in biological control in the laboratory and field condition are required.

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Figures 1-4. Morphological details of *Montandoniola indica* Yamada and *Geocoris amabilis* Stål collected in Syria. 1 – *M. indica*, habitus of a female from Wadi–Al shatter, 2 – *G. amabilis* habitus of a male from Al –Jemaseh, 3–4 *M. indica* from Wadi–Al Shatter; 3 – female, copulatory tube; 4 – male, paramere. Scale bars = 1 mm.