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Discovery of *Pyrrhosoma cf. nymphula* (Odonata: Coenagrionidae) in Algeria

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Abstract. Although odonates of Algeria have been studied for more than 170 years, some habitats such as highland streams have been largely overlooked. Here, we report the first record of *Pyrrhosoma cf. nymphula* in the Kabylia region in a stream running through an oak forest at 1 200 m a.s.l., Algeria. The locality is 400 km from the nearest known population in Tunisia and 650 km from another population Morocco, suggesting a very patchy distribution at higher elevations for the species in North Africa. This new record increases the number of the Algerian odonates to 64 species. In addition, eight other species of Odonata were recorded, three of them range extensions. Further surveys of mountain streams in North Africa are needed to fully determine the distribution of rare odonates, including *P. cf. nymphula*.

Further key words. Damselfly, Zygoptera, North Africa, Meghreb, mountain, stream

Introduction

The Odonata of Algeria have been investigated for more than a century and a half since the 'Exploration Scientifique de l'Algérie' (SELYS 1849). Since then a total of 63 species has been recognized in the country (SAMRAOUI & MENAÏ 1999), although some species are currently regarded as doubtful (e.g., *Cordulia aenea*). Recently, there have been records of several species in new localities, including species of conservation concern such as *Calopteryx exul*, *Urothemis edwardsii*, and *Lindenia tetraphylla* (KHELIFA et al. 2016; KHELIFA & MELLAL 2017; KHELIFA & ZEBSA 2018; CHELLI et al. 2019, 2020). Although many studies have been conducted in various watersheds (e.g., RAZKALLAH & HOUMADI 2018; SENOUCI & BOUNACEUR 2018; CHELLI & MOULAÏ 2019; CHELLI et al. 2020), mountain streams have not received much attention, despite the potential occurrence of rare specialist species (DIJKSTRA et al. 2020).

In this study, we investigate the odonate assemblages of Ait Aloua stream in the Kabylia region, central North Algeria. This highland stream running through a dense oak forest has not only not been explored before but also represents a rarely
surveyed habitat type in odonatological surveys in Algeria. Thus, the check-list presented is an important addition to the existing odonatological knowledge of the country in particular and North Africa in general.

Guan et al. (2013) showed through genetic analyses that the Western Palaearctic Pyrrhosoma species are represented by three clades: nymphula, elisabethae, and the Middle Atlas (Moroccan), with the latter being probably the closest to the common ancestor of the three (Fig. 1). The lack of apparent morphological differences between the Moroccan populations and the European nymphula prevented Guan et al (2013) from bestowing a name on the North African Pyrrhosoma. Until 2014, the only North African region known to harbour Pyrrhosoma were the Moroccan highlands (Middle Atlas Mountains), where it was identified as P. nymphula and regarded as a glacial relict (Boudot et al. 2009). In 2014, the species was reported for the first time from Tunisia in Khroumirian streams, in the north-west of the country (Korbaa et al. 2014). In Algeria, despite increasing odonatological surveys over the last decade (Senouci & Bounaceur 2018; Chelli & Moulaï 2019; Demnati

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Fig. 1. Global distribution of Pyrrhosoma nymphula, including data recorded prior 1990 (●), from 1990 onwards (●) and the new Algerian record of Pyrrhosoma cf. nymphula (■). Map: Jean-Pierre Boudot
et al. 2019; Khelifa 2019), *Pyrrhosoma* has never been confirmed from any locality. Here, we refer to the Maghrebian species of *Pyrrhosoma* as *P. cf. nymphula* until its taxonomic status is clarified.

**Material and methods**

The study site was a stream located in Ait Alaoua at 1207 m a.s.l., 30 km south-east of Tizi Ouzou city (36.474143°N, 4.251615°E). This locality was within the Djurjura national park which occupies 18 500 ha, encompassing dense forests of evergreen *Quercus ilex*, *Cedrus atlantica*, *Alnus glutinosa*, and *Q. suber* (Fig. 2a). The climate is typically Mediterranean with a 3–4 months dry period. Tizi Ouzou province is a relatively humid area with 900 mm annual rainfall and 20°C of annual average temperature. The stream studied was permanent, shallow, relatively fast-flowing, and bordered by bushes and trees (Fig. 2b).

A total of nine visits were conducted each month between March and November 2021. The site was visited in the morning between 10:00 and 13:00 h local time (CET; UTC+1). On each occasion, a 100 m transect along the stream was surveyed. Individuals were collected with a hand net. We retained some specimens of each species to confirm identification in the laboratory. We used the identification keys of D’Aguilar et al. (1998) and Dijkstra et al. (2020) to identify species based on adults.

**Results**

The study yielded a total of nine species: *Calopteryx haemorrhoidalis*, *Ceriagrion tenellum*, *Pyrrhosoma cf. nymphula*, *Aeshna cyanea*, *A. mixta*, *Boyeria irene*, *Onychogomphus uncatus*, *Sympetrum meridionale*, and *S. striolatum*.

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*Fig. 2.* Mountain forest (a) and stream (b) studied at Ait Alaoua stream in Kabylia, Central North Algeria (23.vi.2021). Photos: LAT
Two males of *Pyrrhosoma cf. nymphula* were recorded on 23.vi.2021 (Figs 3a, b). The males were mature and perched on the bank vegetation. We did not record the species on subsequent visits. This is the only locality known for this species in the entire country (Fig. 1).

**Discussion**

Our survey at Ait Alaoua stream in Kabylia generated valuable information for the odonate of North Africa. *P. cf. nymphula* is new to Algeria which plugs a distribution gap between its known ranges in Tunisia and Morocco. This new record is about 400 km away from the nearest Tunisian locality reported by Korbaa *et al.* (2014) and about 650 km away from the nearest limit of the geographic range of Morocco reported by the IUCN Redlist (Kalkman 2014). This suggests that the species has a very patchy distribution in North Africa, where it seems to survive as a glacial relict. While genetic analysis revealed that the Moroccan populations of *P. cf. nymphula* are differentiated from the European populations of both *P. nymphula* and *P. elisabethae* (Guan *et al.* 2013), it would be interesting to determine whether there are any genetic differences among the isolated North African populations in Algeria, Morocco, and Tunisia, as occur in some other zygopteran species (Ferreira *et al.* 2016).

In our study, *P. cf. nymphula* was recorded at a relatively high altitude (~1200 m a.s.l.). The recorded elevation falls within the range of elevations reported for this species in North Africa. The species was thought to be restricted to mid-high elevations in Morocco (1000–1500 m a.s.l.) (Jacquemin & Boudot 1999), but new studies in the north of the country revealed populations at lower elevations (El.

**Fig. 3.** Terminalia of a male *Pyrrhosoma cf. nymphula* in dorsal view (a) and in lateral view (b) from Ait Alaoua stream in Kabylia, Central North Algeria. Photos: LAT
Haissoufi et al. (2015). Both localities that were recently reported for Tunisia were at lower altitudes (~600 m a.s.l.) (Korbaa et al. 2014). Furthermore, P. cf. nymphula was found in a relatively fast-flowing stream within a forest of evergreen oak. The lotic preference of the species is similar to that described for the Tunisian (Korbaa et al. 2014), and most Moroccan populations (El Haissoufi et al. 2015). However, the species shows a wider range of habitat in Europe with both running water and well-vegetated standing water, depending on the region (Dijkstra et al. 2020). In addition to P. cf. nymphula, the regionally rare Aeshna cyanea, Onychogomphus uncatus, and Boyeria irene were also recorded in this study, extending the known geographic range of these species in North Africa. We suggest that lotic mountain habitats in the Maghreb should be better surveyed and monitored to increase knowledge of rare species which may have been overlooked in the past.

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References
Boudot J.-P., Kalkman V.J., Amorin A., Bogdanović T., Rivera A.C., De­
gabriele G., Dommanget J.-L., Fer­
riera S., Garrigós B., Jović M., Lop­
au W., Marinov M., Mihoković N.,
Riservato E., Samraoui B. & Schnei­
der W. 2009. Atlas of the Odonata of
the Mediterranean and North Africa.
Libellula 9: 1-256
Chelli A. & Moulaï R. 2019. Ecologi­
cal characterization of the odonatofau­
na in lotic and lentic waters of north­
est Algeria. Annales de la Société ento­
mologique de France (NS) 55: 430-445
Chelli A., Moulaï R. & Djemai A.
2020. Does the Tichi Haf Dam con­
struction affect dragonfly and damselfly (odonata: insecta) assemblages of the
Boussellam watercourse (central North
Algeria)? A preliminary study. Zoology
and Ecology 30: 37-47
Discovery of a new population of the
deranged Calopteryx exul in central
North Algeria (Odonata: Caloptery­
gidae). Notulae odonatologicae 9: 150-154
d’Aguilar J., Dommanget J.-L.,
Guide des libellules d’Europe et
d’Afrique du Nord: l’identification et
la biologie de toutes les espèces. De­
lachaux et Niestlé
Demnati F., Allache F. & Cohez D.
2019. Contribution à la connaissance
de l’odonatofaune du bassin du Chott
Melghir (Algérie). Bulletin de la Société
zooologique de France 144: 95-104
Dijkstra K.-D., Schröter A. & Lew­
ington R. 2020. Field guide to the
dragonflies of Britain and Europe. Sec­
ond edition. Bloomsbury Publishing,
London


Jacquemin G. & Boudot J.P. 1999. Les libellules (odonates) du Maroc. Société Française d’Odonatologie, Bois d’Arcy, France


Senouci H. & Bounaceur F. 2018. Contribution to the study of diversity and abundance of odonates in some wet biotopes in Tiaret region, Algeria. *Plant Archives* 18: 555-560

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