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A CONTRIBUTION TO THE DIET OF **MARBLED TEAL *Marmaronetta angustirostris*** IN THE LAKE AREA OF OUNIANGA/CHAD

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ABSTRACT.– A contribution to the diet of Marbled Teal *Marmaronetta angustirostris* in the lake area of Ounianga/Chad. Following the discovery of a Marbled Duck *Marmaronetta angustirostris* breeding site in 2023 in the middle of the Sahara in the UNESCO World Heritage Site "Lakes of Ounianga" in northern Chad, further studies were carried out on the near-threatened duck species in May 2024. Excrement samples were analysed and feeding behaviour was observed. Consequently, Ephydridae larvae are obviously consumed in very large numbers and, together with imagines, are the main prey of the Marbled Teal in this lake area.

RÉSUMÉ.– Contribution au régime alimentaire de la Sarcelle marbrée *Marmaronetta angustirostris* dans la zone lacustre d'Ounianga au Tchad. Suite à la découverte d'un site de reproduction de cette sarcelle en 2023 au milieu du Sahara dans le site du patrimoine mondial de l'UNESCO « Lacs d'Ounianga » au Nord du Tchad, des études plus approfondies ont été menées sur cet anatidé quasi menacé en mai 2024. Des échantillons de fientes ont été analysés et le comportement alimentaire a été observé. Il apparaît que les larves d'Ephydridés sont consommées en très grand nombre et constituent, avec les imagos, la principale proie de la Sarcelle marbrée dans cette région lacustre.

Mots-clés : *Marmaronetta angustirostris,* Régime alimentaire, Lac Ounianga/Tchad.

Keywords: *Marmaronetta angustirostris,* Diet, Lac Ounianga/Tchad.

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INTRODUCTION

During recent ornithological field research from 2016 to 2022 in northern Chad in the UNESCO World Heritage Site «Lakes of Ounianga», a significant population of the Marbled Duck *Marmaronetta angustirostris* was found (Schönbrodt, 2009, 2012, 2014; Hering *et al.*, 2022; West African Bird Database *www.wabdab.org*). Studies during the breeding season in May 2023 and 2024 showed that this near-threatened duck species (BirdLife International, 2023) is even a common breeding bird there. In addition to breeding data, information was also collected on the behaviour, diet and threats to the population (Hering *et al.*, 2022, 2023a, b, *in prep.*). In particular, feeding behaviour was intensively observed and documented. It was obvious that the brine-/shore-fly *Haloscatella dichaeta*, which is widespread in Africa, is the main food of the ducks (Schönbrodt, 2012, 2014). This seemingly inexhaustible source of protein is certainly one of the reasons for the mass occurrence of Marbled Teal on the Ounianga Lakes. The previous results on the diet of the Marbled Duck in the Ounianga area have now been supplemented by a analysis of excrement samples. The results are presented here.

MATERIAL AND METHODS

Excrement samples were collected in the southwest part of Lake Teli in Ounianga Serir (18°55'28.06"N 20°51'31.42"E, 346 m a.s.l.) and feeding Marbled Teals were mainly studied on Lake Yoa in Ounianga Kebir (19°2'49.99"N 20°29'49.29"E, 379 m a.s.l.) (PHOTOS 1-2). The lakes of Ounianga are situated just south of the Erdi Plateau between the Tibesti and Ennedi mountains, clustered in two lake regions about 50 km apart. For a summary of lake morphology, water and bottom-substrate data of permanent waters at Ounianga Kebir and Ounianga Serir see KRÖPELIN (2007a, b) and van BOCXLAER *et al.* (2011).

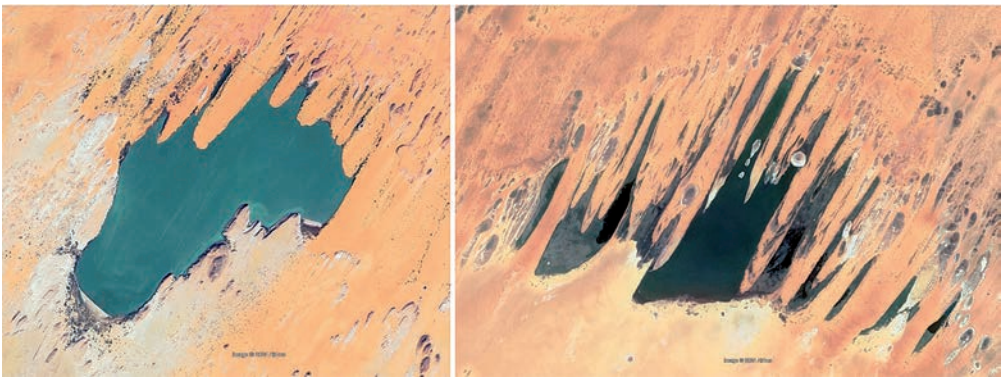
The material was picked up from the ground, then dried and packed in plastic boxes. Fifteen samples were examined. The samples were soaked in water and examined under a stereomicroscope (Zeiss Technoval 2 and Zeiss Discovery V12).

RESULTS

From 11 to 13 May 2024, about 150 Marbled Teals remained on a sandbank in the southwest of Lake Teli, mostly all day, and we mainly observed comfort and resting behaviour (PHOTO 3). There were also two other duck species; around 20 Cape Teals *Anas capensis* and a male Northern Pintail *Anas acuta*. The majority of the Marbled Teals used the sandbank over a length of around 100 m. In the afternoon of 13 May excrement samples were collected over a length of 30 m (PHOTO 4).

The excrement analysed was greyish-white to yellowish in color. Four samples consisted almost exclusively of fine sand grains. Very small, indeterminable plant fragments and fibres were found in 11 samples in higher proportions (approximately between 20 and 60 % by volume). Five samples contained parts (head capsules, wing fragments, legs) of a total of 11 Ephydridae imagines, another contained an unidentifiable water beetle about 5 mm long. The predominant animal content in the dropping samples consisted of fragments of Epyhdridae larvae and puparia, which were present in high numbers in all samples examined without exception (PHOTOS 5-6). Each of the samples examined contained several hundred chitinous bristles of the larval stubbed legs.

Ephydridae larvae are obviously consumed in very large quantities and together with imagines are the main prey of Marbled Teals in this lake area. This is an important addition to our data, as we previously only had observations of Marbled Teals feeding on the water surface and assumed that mainly imagines were consumed. Almost all birds observed were busy feeding, resting the



PHOTOS 1-2.– Geographical location of the study areas in Ounianga. Lake Yoa in Ounianga Kebir (left) and Lake Teli in Ounianga Serir (right), located in the centre (GOOGLE EARTH).
Localisation géographique des zones d'étude à Ounianga. Le lac Yoa à Ounianga Kebir (à gauche) et le lac Teli à Ounianga Serir (à droite), situés au centre (GOOGLE EARTH).

Photo 3.– Over 150 mainly adult Marbled Teals *Marmaronetta angustirostris* on a sandbank in the southwest of Lake Teli. The excrement samples for analysis were collected here, Ounianga Serir, Chad, 13 May 2024 (J. Hering).

Plus de 150 Sarcelles marbrées, principalement adultes (Marmaronetta angustirostris), *sur un banc de sable au Sud-Ouest du lac Teli. Les échantillons des fientes destinés à l'analyse ont été collectés ici, à Ounianga Serir, au Tchad, le 13 mai 2024 (J. Hering)*.

Photo 4.– The excrement samples were collected on this sandbank in the southwest of Lake Teli, Ounianga Serir, Chad, 13 May 2024 (J. Hering).

Les échantillons de fientes ont été collectés sur ce banc de sable au Sud-Ouest du lac Teli, Ounianga Serir, Tchad, le 13 mai 2024.

Photos 5-6.– Fragments of Epyhdridae larvae and puparia (H. Grimm).

Fragments de larves et de pupes d'Epyhdridés (H. Grimm).

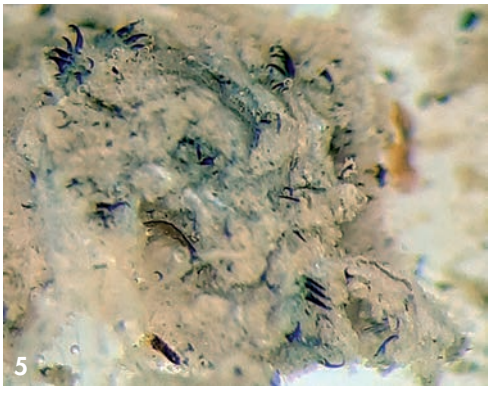


Photo 7.– Marbled Teal *Marmaronetta angustirostris* typically feeding with submerged bill on Lake Yoa, Ounianga Kebir, Chad, 19 May 2023 (M. Winter).

Sarcelle marbrée Marmaronetta angustirostris *se nourrissant généralement avec le bec immergé sur le lac Yoa, Ounianga Kebir, Tchad, 19 mai 2023 (M. Winter).*

lower mandible on the water surface, the bill half submerged or the head completely submerged (Photo 7). Even chicks that were only a few days old were using this feeding method perfectly (Photo 8). Adult teals repeatedly sought out a narrow siltation zone of *Phragmites* and *Typha* in the southwestern parts of Lake Yoa and Lake Teli, where they fed incessantly for minutes in the shelter of the vegetation, but also in the open at the drift line, although these flies were also consumed on completely open water. Particularly striking were centimetre-thick carpets of brine- or shore-flies concentrated in the shore zones of the relevant lakes (Photo 9). Once we observed masses of larvae piled up on the southern shore of Lake Teli, caused by strong winds and waves (Photo 10).

Ephydridae are well-known as food of Marbled Teal (Iñigo *et al.*, 2008). That these flies also serve as food, especially for chicks, is known from other areas where they occur

Photo 8.– Chicks of Marbled Teal *Marmaronetta angustirostris* feeding on flies of the family Ephydridae, Lake Teli, Ounianga Serir, Chad, 19 May 2023 (M. Winter).

Poussins de Sarcelle marbrée Marmaronetta angustirostris *se nourrissant de mouches de la famille des Ephydridés, lac Teli, Ounianga Serir, Tchad, 19 mai 2023 (M. Winter).*

Photo 9.– Flies of the family Ephydridae in the shore area of Lake Teli, Ounianga Serir, Chad, 19 May 2023 (J. Hering).

Diptère de la famille des Ephydridés dans la zone côtière du lac Teli, Ounianga Serir, Tchad, 19 mai 2023 (J. Hering).

Photo 10.– Larvae of the family Ephydridae in the shore area of Lake Teli, Ounianga Serir, Chad, 12 May 2024 (J. Hering).

Larves de la famille des Ephydridés dans la zone côtière du lac Teli, Ounianga Serir, Tchad, 12 mai 2024 (J. Hering).

(Green & Sánchez, 2003), and in general aquatic invertebrates are preferably eaten at this stage in their life cycle (Fuentes *et al.*, 2004). The Cape Teal, which is thought to breed in Ounianga and of which pairs were observed copulating on Lake Yoa and Lake Teli in May 2023 and 2024, also benefits from the abundant food supply, as do all other waterbird species that rest at this site during migration and in winter (Hering, 2022).

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ERRATUM

ALAUDA (3) 2024: Hering (J.) & Grimm (H.).– Dragonflies (*Odonata*) are the main prey of the Rock Martin *Ptyonoprogne fuligula* at Lake Nasser/Egypt. Unfortunately, we made a mistake in this article. On page 188, Table I, it should be correct: *Ischnura senegalensis*.