

# Observation of Variable Seedeater *Sporophila corvina* (P.L. SCLATER, 1860) feeding on filamentous algae near the Tropical Research Station La Gamba, Costa Rica<sup>1)</sup>

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The Tropical Research Station La Gamba in Costa Rica is an excellent place for field studies. In 2006 Variable Seedeaters (*Sporophila corvina*) were repeatedly observed there feeding on green algae (*Spirogyra* sp.). Analysis of literature revealed that this rarely observed phenomenon occurs at least pan-tropically. Causes why mostly seed-eating birds feed on these highly nutritious algae are discussed.

**AUBRECHT G. & WEISSENHOFER A., 2020: Beobachtungen an algenfressenden Mohrenpfäffchen *Sporophila corvina* (P.L. SCLATER, 1860) nahe der Tropenstation La Gamba, Costa Rica.**

Die Tropische Forschungsstation La Gamba eignet sich perfekt zur Durchführung von Feldstudien. 2006 wurden dort Mohrenpfäffchen (*Sporophila corvina*) wiederholt beim Fressen von Fadenalgen (*Spirogyra* sp.) beobachtet. Analyse der Literatur ergab, dass dieses selten beobachtete Phänomen zumindest pantropisch vorkommt. Gründe, warum körnerfressende Vögel diese höchst nährreichen Algen fressen, werden diskutiert.

**Keywords:** Variable Seedeater, algae feeding, tropical research station La Gamba, Costa Rica.

## The Tropical Research Station La Gamba as a focal point for research, education and conservation studies in SW Costa Rica

The southwestern parts of Costa Rica are famous for their great diversity of ecosystems and biodiversity. Especially the area around the Golfo Dulce and adjacent mountains is rich in species (HUBER et. al 2008) and still boasts a high proportion of natural forest cover, protected in the two national parks, the Corcovado and the Piedras Blancas National Park.

The altitude in the Golfo Dulce region ranges from sea level up to 745 m on the Osa Peninsula (Cerro Rincón and Cerro Mueller in the Fila Matajambre) and up to 579 m in the Esquinas forest (Cerro Nicuesa). To prevent habitats from becoming isolated, biological corridors such as COBIGA and AMISTOSA have been established (WEISSENHOFER et al. 2019) to connect the lowland forests of the Golfo Dulce (from sea level) with the montane forests of the Fila Cal (Cerro Anguciana 1707 m) and further on up to the high mountains of the Amistad National Park.

According to the Holdridge Life Zone System (HOLDRIDGE 1967, HOLDRIDGE et al. 1971), the main life zones in the lowlands of the Golfo Dulce region are the Tropical Wet Forest, the Tropical Moist Forest and the Tropical Premontane Wet Forest. Vegetation analyses in the Piedras Blancas National Park and adjacent areas showed a high ecosystem diversity with 28 different ecosystems, ranging from untouched primary to secondary and anthropogenic vegetation (WEISSENHOFER et. al 2008).

<sup>1)</sup> We dedicate this paper to our friend Fritz SCHIEMER on the occasion of his 80<sup>th</sup> birthday. As the paper has a focus on a combination of limnic habitat, strange feeding ecology and fieldwork conducted at the Tropical Research Station La Gamba, hopefully Fritz – being an enthusiastic ecologist und limnologist – will be pleased.

To study the nature of the Piedras Blancas National Park, the Tropical Station La Gamba (N 8°42'61", W 83°12'97", 70 m above sea level) was founded in 1993 by the Association "Rainforest of the Austrians" in cooperation with the University of Vienna (Fig. 1). A small farmhouse called Finca Alexis was bought in 2015, and now serves as a base camp for research at the transition zone between the lowland forests of the Golfo Dulce region and the mountain forests of the adjacent Fila Cal. Besides providing immediate access to various tropical ecosystems, both terrestrial and aquatic, the station is ideally suited for studying applied aspects, e.g. in the conservation and reforestation projects of the Tropical Station (HUBER & WEISSENHOFER 2019).



Fig. 1: Location of the Tropical Research Station La Gamba and its ecological environments (Photo: A. WEISSENHOFER, 2019. Tropical Research Station La Gamba at bottom). – Abb. 1: Lage der Tropenstation La Gamba und ihre ökologische Umgebung (Foto: A. WEISSENHOFER, 2019. Tropenstation La Gamba am unteren Bildrand).

## Field Observation

Research for conservation has a long tradition in Costa Rica and Alexander Skutch (1904–2004) showed perfectly how close observation of nature can generate new interesting scientific questions and contributions to natural history without much technical support (SKUTCH 1971). The first documented observations of Variable Seedeaters (*Sporophila corvina*) feeding on green algae at the Tropical Research Station La Gamba, Costa Rica provide a perfect example. During a short stay at the Tropical Research Station La Gamba in 2006, Gerhard AUBRECHT and Stephan WEIGL observed 2 individuals of *Sporophila corvina* at a small pond in the vicinity of this station ("caiman pond"). The pond is situated at the edge of a primary tropical lowland wet forest (WEISSENHOFER et al. 2008). Multiple observations were made from 28 to 30 January, 2006. The birds exhibited a peculiar behavior. They clung to small branches rising above the water level near the pond's edge and actively fed on the mass of green algae attached to these branches (Fig. 2). This behavior was observed again in February 2006 by Anton WEISSENHOFER and Peter WEISH. Samples of the algae taken for determination showed that the algae mass was dominated by *Spirogyra* sp., accompanied by *Anabaena* sp., *Cymbella* sp., *Hyalotheca* sp. and *Mougeotia* sp. (det. W. ADLASSNING) (Fig. 3).

Variable Seedeaters occur predominantly in more open landscape patches around La Gamba (TEBB 2008). In late January 2010 the author could confirm the breeding (nest observation) of *Sporophila corvina* there (Fig. 4). Variable Seedeaters feed almost exclusively on dry seeds. Only during the breeding season are additional protein rich food sources such as insects used (JARAMILLO & SHARPE 2020).

While feeding on green algae is widespread in waterbird species it is rarely known from birds not closely bound to limnic habitats.

Feeding on filamentous algae is already known from some Fringillidae species, such as Black and White Mannikin *Lonchura bicolor* (Africa), White-rumped Mannikin *Lonchura striata* (SE Asia), New Britain Mannikin *Lonchura spectabilis* (New Guinea), Pictorella Finch *Lonchura pectoralis* (Australia), Bronze Mannikin *Lonchura cucullata* (Africa) (CLEMENT et al. 1993, PILLAI 1968), Scaly-breasted Munia *Lonchura punctulata* (SE Asia)



Fig. 2: *Sporophila corvina* feeding on *Spirogyra* sp. algae at the caiman pond near the Austrian Tropical Research Station La Gamba, Costa Rica (Photo: G. AUBRECHT, 28 January, 2006). – Abb. 2: *Sporophila corvina* frisst an *Spirogyra* sp. Algen beim Caiman-Teich nahe der Österreichischen Tropenstation La Gamba, Costa Rica (Foto: G. AUBRECHT, 28. Jänner 2006)



Fig. 3: *Spirogyra* sp. algae from the caiman pond near the Austrian Tropical Research Station La Gamba, Costa Rica, 28 January, 2006 (det. ADLASSNIG). – Abb. 4: *Spirogyra* sp. Algen aus dem Caiman-Teich nahe der Österreichischen Tropenstation La Gamba, Costa Rica, 28. Jänner 2006 (det. ADLASSNIG).



Fig. 4: *Sporophila corvina* female on nest, late Jan. 2010, farm entrance beside the road between the village La Gamba and the Austrian Tropical Research Station La Gamba, Costa Rica. (Photo: G. AUBRECHT). – Fig. 4: *Sporophila corvina* Weibchen am Nest, Ende Jänner 2010, Hofeinfahrt neben der Straße zwischen dem Dorf La Gamba und der Österreichischen Tropenstation La Gamba, Costa Rica (Foto: G. AUBRECHT).

(blog Amar Singh 2009; April 23 2020) as well as from American Goldfinch *Carduelis tristis* (N America) (DIGIOLA 1973). STILES et al. (1989) and WETMORE et al. (1984) do not refer to algae as diet of Neotropical Emberizidae, respectively of *Sporophila corvina*.

AVERY (1980) observed algae feeding of *Lonchura striata* in rice fields in Malaysia. He outlines the nutritive value of filamentous algae and draws a correlation between algae consumption and the breeding disposition of this Manakin species. Apparently, the sexual traits of *Lonchura striata* are stimulated by the protein rich diet of algae. Also, Great Blue Turacos *Corythaëola cristata* from Gabun are reported to feed regularly on filamentous algae. These foliage-feeding birds supposedly use the high protein und sodium contents of the algae (FAURE et al. 2007). SUN et al. (1997) observed this behavior on the same species, also on the Ruwenzori Turaco (*Musophaga johnstoni*) and the Black-billed Turaco (*Tauraco schuettii*) in tropical mountain forests in Rwanda.

Algae (*Spirogyra* sp.) as a nutritive diet for commercial bird breeding is also well known by bird keepers and commercially available (ALI et al. 2005, SARAGIH et al. 2019). These effects are even better known from the highly nutritious *Spirulina* sp. algae (ABOUELLEZ 2017).



Pharmacological studies reveal antioxidant, anti-inflammatory and immunomodulatory factors in *Spirogyra neglecta* (SURAYOT et al. 2015, THUMVIJIT et al. 2013, MESBAHZADEH et al. 2018). *Spirogyra varians* was evaluated for its nutritional contents (TIPNEE et al. 2015)

Taking into account that seed-eating birds feeding on filamentous algae are a pantropical phenomenon, further studies clarifying to what extent this food source is particularly important during the breeding season seems to be interesting.

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