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SHORT COMMUNICATION

A DRAGONFLY MIGRATION IN THE HIGH HINDU KUSH (AFGHANISTAN), WITH A NOTE ON HIGH ALTITUDE RECORDS OF *AESHNA JUNCEA MONGOLICA* BARTENEV, AND *PANTALA FLAVESCENS* (FABRICIUS) (ANISOPTERA: *AESHNIDAE, LIBELLULIDAE*)

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A large scale dragonfly migration across the main crest of Hindu Kush was observed on August 9, 1973 in the upper Mandaras Valley, at an elevation of about 6000 m. Due to the difficult terrain no specimens could be collected and therefore the identity of the species involved is uncertain. On July 25 and 28, however, 2 dead specimens of *A. juncea mongolica* Bart. were recovered on the Mandaras Glacier, at approximate altitudes of 4600 and 5000 m respectively. These are the highest hitherto known records of this species.

INTRODUCTION AND TOPOGRAPHIC DESCRIPTION OF THE REGION

Alpine dragonfly migrations are a well known phenomenon (cf. WILLIAMS, 1961), though very little information on the subject has so far become available from the Central Asian mountains. It seems useful, therefore, to bring on record our observations on a large scale migratory flight in the nival zone of High Hindu Kush, carried out during the Polish 1973 Hindu Kush Expedition.

The migration was observed in the upper part of Mandaras Valley, Wakhan Region, Afghanistan. The Mandaras Valley is a side valley of the Qadzy Deh Valley, which runs North from the main crest, at the foot of the Noshaq Range (7492 m) to the Abe Panj Valley. The Mandaras leaves the Qadzi Deh at the approximate altitude of 3100 m, running first in a South-East direction, turning to the East in its terminal part. The upper part of the valley (4500 m and onwards) is filled with a glacier and surrounded by peaks of 6200-6800 m height (cf. Figs. 1 and 2).

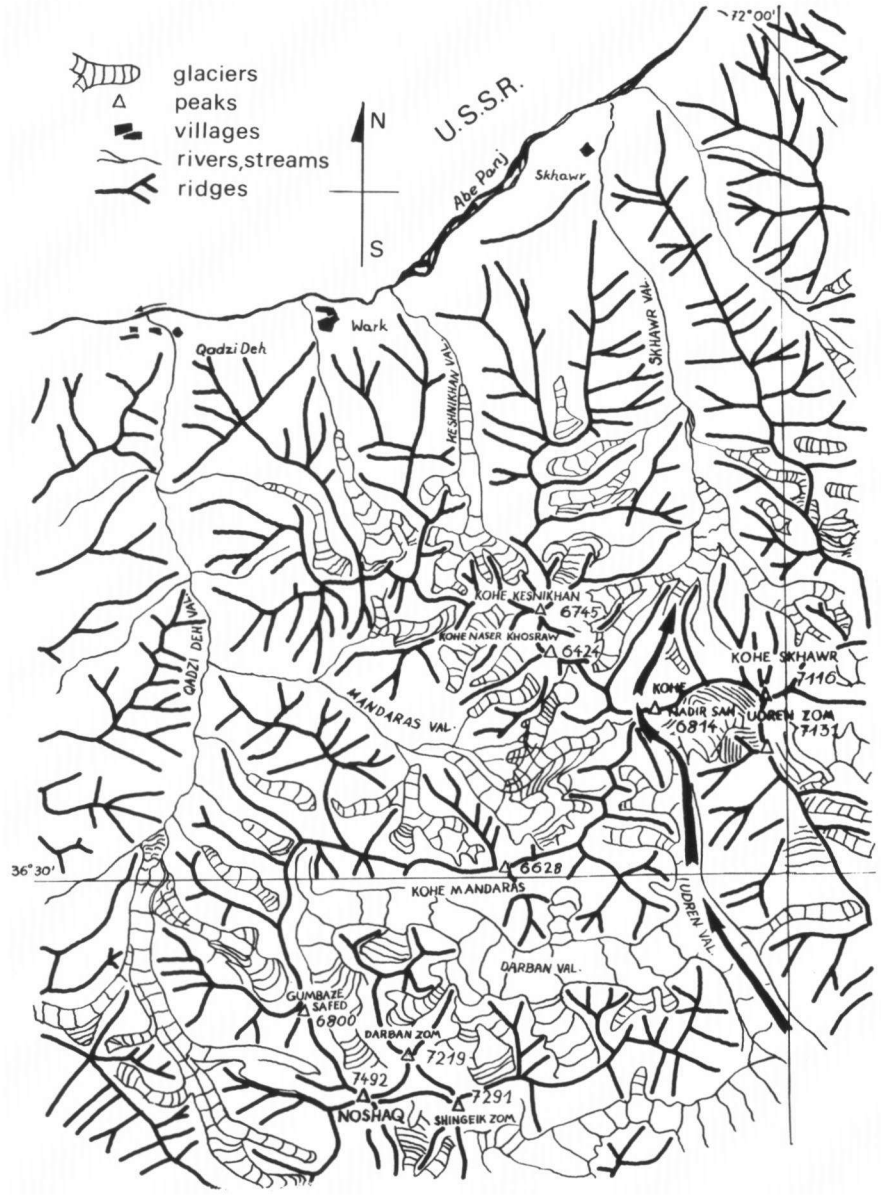

Fig. 1. Topographical sketch of the terrain according to J. WALA. The supposed flight directions are indicated by arrows.

OBSERVATIONS AND DISCUSSION

The migration was observed on August 9, 1973, at the place where the west ridge of Kohe Nadir Sah (6814 m), running to Kohe Naser Khosrav (6424 m) makes a well marked depression. The elevation of the spot is about 6000 metres (cf. Fig. 2). The phenomenon commenced at about 11.00 a.m. and lasted approximately one hour. The air temperature did not exceed 10°C, while a weak wind was blowing from the South.

Dragonflies were migrating in the South-North direction, crossing the west ridge and forming a sparce cloud of about 50 m in width. The wind did not seem to exert any visible effect on their flight.

The flight direction may suggest that the insects were migrating from the

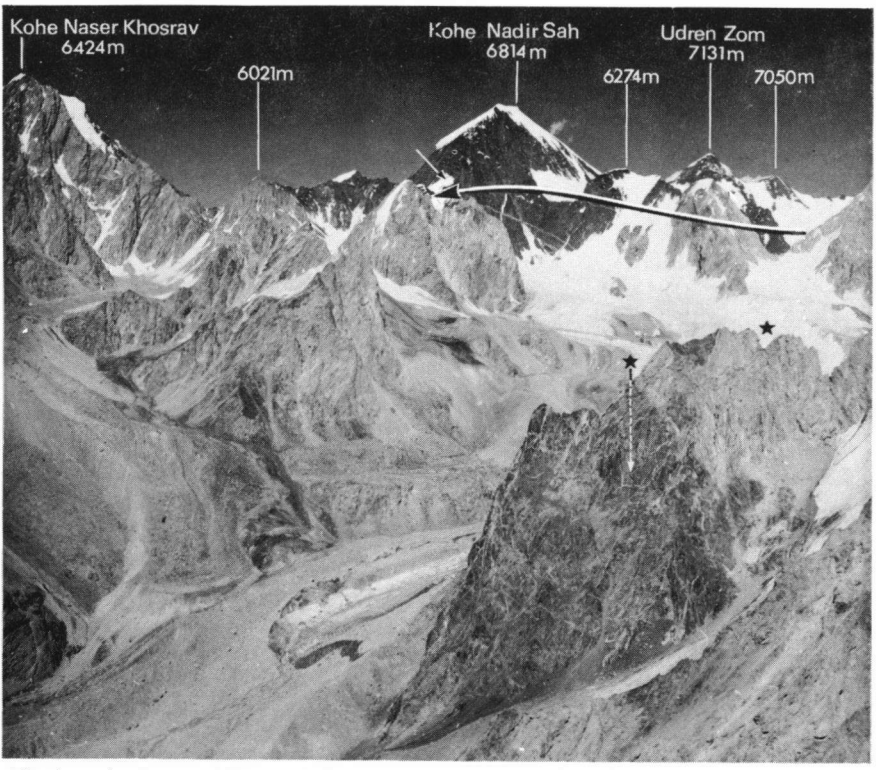

Fig. 2. A landscape photograph showing the upper part of the Mandaras Valley, as viewed from the West. The longer arrow marks the flight direction; the shorter one the spot at which the observation was carried out. The two asterisks indicate the places where dead specimens of *Aeshna juncea mongolica* Bartenev were found on the glacier (note that the left asterisk is projected behind the foreground rock).

Chitral in the South, towards the Wakhan Valley, crossing the main Hindu Kush crest just at the spot of our observation. Unfortunately, we could only stay there a few hours and were thus unable to ascertain whether or not the phenomenon reoccurred during the next few days.

One may assume tentatively that the long meridional Hindu Kush valleys are generally used as insect migratory tracks on their routes from southern Central Asia towards the North. This suggestion is supported by the observations on *Pyrameis cardui* (L.) (Lepidoptera: *Nymphalidae*) (WOJTUSIAK, 1967).

It is worth noting that, though single dragonfly specimens were repeatedly taken at similar elevations, this is the highest altitude at which a proper large scale migratory flight has ever been recorded.

As far as is known, only one other dragonfly migration occurred in the territory of Central Asia during 1973, viz. that of *Libellula quadrimaculata* L. in the surroundings of Novosibirsk, USSR (BELYSHEV, 1973). In view of the hypothesis advanced by DUMONT & HINNEKINT (1973) it is not unlikely that there is a closer relationship between the two phenomena than might be expected in view of the large geographic distance between the two places.

Due to the difficult terrain it was technically impossible to collect any specimens, hence the identity of the species involved remains uncertain. There are but a few Central Asiatic anisopterans migrating at high alpine elevations and for over long distances, viz. *Aeshna juncea* (L.), *Hemianax ephippiger* (Burm.) and, above all, *Pantala flavescens* (Fabr.). While, to our knowledge, high alpine migratory flights of *H. ephippiger* have never been observed in the Central Asian mountains, the possible participation of the other two species should be considered in some detail.

AESHNA JUNCEA (L.)

This is a well known alpine "migrant", both in Europe and in North America. In Afghanistan it is represented by the infraspecific form *A. juncea mongolica* Bartenev, the highest hitherto known record of which was published by SCHMIDT (1961) as "Pamir de China, NE Afghanistan, 3000 m, 24-VII-1959". On July 25 and 28, 1973 we collected two dead specimens on the Mandaras Glacier at elevations 4600 and 5000 m respectively (cf. Fig. 2). These are the highest known localities of this or any other infraspecific form of this species. Single *Aeshna*-like dragonflies were seen on the wing also by GORODKOV (1961), in Eastern Pamir, USSR., at elevations 3600-3660 m (11-13-VII-1948).

While migrating *Hemianax ephippiger* and *Pantala flavescens* usually appear in large swarms, *A. juncea*, on the other hand, is known solely as an "ungerichteter Einzelwanderer" (KAISER, 1964): single individuals, particularly in the mountainous regions, often cover considerable distances and are occasionally found high in the subnival and nival zones, but have never been observed forming

groups of any size. It is highly unprobable, therefore, that the above described swarm consisted in part or entirely of this species. The two recovered specimens should doubtlessly be regarded as solitary, erratically migrating individuals.

PANTALA FLAVESCENS (FABR.)

This nearly cosmopolitan libellulid has an impressive migration record throughout its range, and from sea level to the nival zone elevations. More recently at least the following Central Asian high altitude localities have been placed on record: Changu La, Khumbu Himal, East Nepal, 6300 m approx., 30-III-1954 (JACKSON, 1955); Upper Chenab Valley, Punjab Himalaya, India, 3352 m, 1-VI-1954 (SINGH, 1955; MANI, SINGH, GUPTA & BAIJAL, 1955; MANI & SINGH, 1961; all under *Sympetrum tandicola* Singh; for the synonymy cf. MITRA, 1973); Tahtakorum Pass and other localities, East Pamir, USSR, 3750-5000 m, VIII-1948 (GORODKOV, 1961); and Dudh Kosi Valley, under Tangpoche, Khumbu Himal, East Nepal, 3400 m, 21-V-1964 (ST. QUENTIN, 1970).

In view of the above evidence, it is most likely that the described migration should be ascribed to this species.

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The specimens are in the collections of the Netherlands Centre for Alpine Biological Research (N.C.A.B.R.), Utrecht.

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