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**REPRODUCTION OF *Eurygaster integriceps* Put. AND *Aelia furcula* F.  
IN THEIR HIBERNATION SITES AND IT'S CONNECTION  
WITH THESE BUGS EXTENSION IN IRAN<sup>1</sup>**

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**ABSTRACT**

Observations carried out in eight hibernation sites in the high plateau of Central Iran, from 1984 on, proved the existence of a considerable population of Sunn Pest remaining in the altitudes where they feed on a considerable number of wild plants belonging to different botanical families.

So far, we have found 17 plants being fed by hibernated adults of Sunn Pest and their off - spring, among which eight have been found to be used by the adults and nymphs of *Aelia furcula* Fieb.

In some of the investigated overwintering sites we have surprisingly found the oophagous parasites of the genus *Trissolcus*, being sufficiently active and abundant. This phenomenon proves the installation of a more or less important population of *E. integriceps* in their hibernating sites.

The destruction of high lands vegetation by the increasingly expansion of

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rain-fed cereals and its relation with the evident extension of these pests in recent years is discussed.

## INTRODUCTION

Vojdani (1954) gave a brief remark of the phenomenon that a number of Sunn Pest hibernated adults remain in the mountains.

Radjabi (FAO report in 1963, Tehran) observed during April 1960, the feeding of the hibernated adults of Sunn Pest on the graminaceous wild plants in Sah - Sepid mountain in Esfahan region. He noticed that among ten adult females captured, seven had the well - formed eggs in their ovaries.

Martin and Javahery (FAO report in 1963, Tehran) reported the nymphs of Sunn Pest feeding on *Hordeum bulbosum* L., during May 1960, in Ghalajeh mountain of Bakhtaran Province.

Javaheri, in an unpublished report, mentioned another graminaceous plant *Heterathelium piliferum* (Banks & Soland.) Hochst, as a host plant of the nymphs of Sunn Pest in the mountains of Lorestan (Zagross region), during May 1969.

Safavi (1983) discussed briefly the expansion of rain - fed cereals in the mountains and the danger that could be resulted to help Sunn Pest to increase its vitality and consequently its extension.

## MATERIALS AND METHODS

Four provinces have been surveyed in this regard. The localities observed are :

### Hamadan Province

1 - Alvand altitudes, overlooking the town of Assadabad.

2 - Boghati mountain, overlooking Kabootar - Ahang region.

### Lorestan Province

3 - Southern Oshtoran Kooh, near the town of Dorood .

4 - Zagheh altitudes, near the town of Zagheh .

### Markazi Province

5 - Chenar altitudes, near the town of Mahallat .



6 - Varcheh altitudes, near the town of Khomeyn .

7 - Poogerd altitudes, near the town of Tafresh .

#### Tehran Province

8 - Fashand altitudes, overlooking Savojboolagh region of Karaj .

The sites surveyed are, in general, 1800 - 2150 meters high and are favourable for overwintering of Sunn Pest (see the map in Farsi text).

The plants have been observed during May and June in four consecutive years.

### RESULTS AND DISCUSSION

The plants being fed by the nymphs and adults of cereal bugs are listed according to the different botanical families :

#### Gramineae

- 1- *Agropyron* cf. *caespitosum* C. Koch, being fed by *E. integriceps* and *A. furcula* in Chenar altitudes.
- 2- *Agropyron libanoticum* Hack., being fed by *E. integriceps* in Fashand altitudes.
- 3- *Agropyron trichophorum* (Link.) Richter, being fed by *E. integriceps* in Boghati altitudes.
- 4- *Bromus danthoniae* Trin., being fed by *E. integriceps* and *A. furcula* in Varcheh altitudes.
- 5- *Bromus tectorum* var. *hirsutus* Regel, being fed by *E. integriceps* in Poogerd and by *E. integriceps* and *A. furcula* in Varcheh altitudes.
- 6- *Bromus tectorum* var. *tectorum* L., being fed by *E. integriceps* in Zagheh altitudes.
- 7- *Bromus tomentellus* Boiss., being fed by *E. integriceps* in Boghati and Poogerd altitudes.
- 8- *Eremopyrum bonapartii* (Spreng.) Nevski var. *sublanuginosum* (Drobov) Melderis, being fed by *E. integriceps* and *A. furcula* in Varcheh.
- 9- *Heterantherium piliferum* (Banks & Soland.) Hochst, being fed by *E. integriceps* in Southern Oshoran Kooch and Zagheh altitudes and by *E. integriceps* and *A. furcula* in Varcheh.
- 10- *Hordeum bulbosum* L., being fed by *E. integriceps* in Boghati mountain.

- 11- *Hordeum glaucum* Steud., being fed by *E. integriceps* in Zagheh altitudes.
- 12- *Hordeum spontaneum* C. Koch, being fed by *E. integriceps* and *A. furcula* in Alvand altitudes.
- 13- *Poa bulbosa* L., being fed by *E. integriceps* and *A. furcula* in Alvand altitudes.
- 14- *Stipa hohenackeriana* Trin & Rupr., being fed by *E. integriceps* in Fashand altitudes.
- 15- *Taeniatherum crinitum* (Schreb.) Nevski, the adults of *E. integriceps* found on this plant, had had well - formed eggs in their ovaries in Fashad altitudes.

#### Compositae

- 16- *Helichrysum oligocephalum* Dc., being fed by *E. integriceps* in Boghati and Southern Oshtoran Kooch altitudes.

#### Papaveraceae

- 17- *Hypocoum pendulum* L., being fed by *E. integriceps* and *A. furcula* in Varcheh.

#### Caryophyllaceae

- 18- *Silene cf. arguta* Fenzl., being fed by *E. integriceps* in Boghati altitudes.

The real number of the host plants of remaining portion of cereal bugs in their overwintering sites is obviously much more than eighteen in Iran. The importance of this phenomenon and the considerable number of non - migrating individuals encourage us to put more emphasis on the studying the possible relations between the ecological conditions of the hibernation sites and the expansion of the distribution areas of cereal bugs.

In Boghati and Fashand mountains we have found *Trissolcus grandis*, *T. semistriatus*, *T. basalis* and *T. rufiventris* in the *E. integriceps* hibernating sites. This phenomenon proves the installation of a more or less important population of cereal bugs in the mountains.

In recent years the distribution of *E. integriceps* and with a less importance that of *A. furcula* is becoming wider in Iran. This increasingly evident extension of cereal bugs results from many factors among which two are, in our opinion, the most fundamental ones :



1 - Continuous destruction of the high land vegetation resulted firstly from the gradual expansion of the rain - fed cereals and other crops in the altitudes where the remaining individuals of cereal bugs reproduce and secondly from the irrational pasturing on these lands, which are the consequences of population growth in the country.

2 - Irrational use of chemicals which is believed to play an important part in diminishing the natural reserve of beneficial arthropodes especially the insect parasites.

As a result of the continuous changes being happened in the hibernation sites of cereal bugs, two events are happening simultaneously :

- Destruction of the plants which are fed by the remaining population of cereal bugs in the altitudes, forcing them to migrate to cereal field, in the plains.

- Replacement of the wild host plants by rain - fed wheats, in other words to provide them with a better source of nutrition and consequently to help the bugs to increase their vitality.

In this regard some brief comments of the Sunn experts are given below :

Fedotov (1947) revealed that the nymphs fed on wild grasses give rise to adults having low level of vigours consisting of the productiveness of the ovaries. Vinogradova (1965) found that the females being fed on *Agropyron trichophorum* laid an average of 51 eggs, as compared with 92 for females fed on wheat from the field. Taranukha (1967) proved that the number of eggs of the females of Sunn Pest fed on grasses is much lower than that of the females fed on wheat, and finally Yüksel (1968) found that the nymphs of Sunn Pest developing on wild graminaceous plants give rise to adults weighing less than adults from nymphs that had developed on wheat .

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