CHAPTER VII

Mites of the family Acaridae (Ewing and Nesbitt 1942) are commonly called as "forage mites". They constitute a group of economically important mite species as majority of them cause direct and indirect damage to stored products. This family includes the genus Rhizoglyphus which is a group of serious mite pests of ornamental bulbs, onion, potatoes, tulip and carrot in storage and in the field. This group has also been seen on the mushrooms, fallen fruit, forest litter and on the roots of wheat, oats and yams in the field. Their feeding results in rotting of the bulbs during storage and stunting of growth in the field. Rhizoglyphus mites are also closely associated with the bulb diseases caused by Fusarium, Stromatinia and Pseudomonas fungi (Forsberry 1965). They develop and reproduce rapidly at high humidities or in moist situations.

DIAGNOSIS OF THE FAMILY

The family Acaridae can be well differentiated by the following characters:

i. Chelate chelicerae;

ii. Long setae on the idiosoma usually;

iii. Stigmata present or lacking, when present situated at
the base of gnathosoma.

**PRESENT KNOWLEDGE OF RHIzOGlyphus Mites**

**IN INDIA AND ABROAD**

Fumouze and Robin 1868 described for the first time *Rhizoglyphus echinopus* and Claparede described *Rhizoglyphus robini* in 1869. Manson (1972) described 9 species of this genus, including 7 new species. He described *Rhizoglyphus singularis* Manson on yams from India. Wadhi and Verma (1972) recorded for the first time *Rhizoglyphus echinopus* on bulbs from India.

**GENUS -- RHIZOGlyphus (CLAPAREDE 1869)**

**TYPE SPECIES -- Rhizoglyphus robini** (Claparede 1869)

It can be differentiated by the following features:

i. Propodosoma bears Grandjean's organ and a supra coxal seta;

ii. Hysterosoma bears a full set of internal, external, lateral and dorsal setae $d_1 - d_4$, h.e. h.i., la, lp, Sa. e and Sa. i.;

iii. A prominent conical spine present on the terminal part of tarsi 1st and 2nd; tarsi 1st - 3rd show a constant number of setae in both sexes, tarsus 1st bears one solenidion. Tarsus 4th of male bears two copulatory suckers;

iv. Heteromorphic males and hypopi are produced in addition to normal males and females. Heteromorphic males are recognised by
an enlarged 3rd leg which is clasping in nature. Hypopus is a non-feeding deutonymph produced in unfavourable conditions for the dispersal.

This genus is being recorded for the first time from North western Himalayan region.

MORPHOLOGY

Body of the adult female is distinguishable into :-

i. Gnathosoma bearing chelicerae and hypostome;

ii. Propodosoma with Grandjean's organ and supra coxal seta;

iii. Hysterosoma provided with internal, external and dorsal setae;

iv. Venter bearing apodemes anal setae; setae on venter few and short in comparison to dorsum;

v. Legs four pairs. Tarsus with a stout claw and covered with a reduced pretarsus. Solenidion are present.

**Rhizoglyphus robini** (Claparede 1869)

(Plates - XXIII, XXIV & XXV)

Rhizoglyphus robini  

Rhizoglyphus solani  
Oudemans, 1924, *Acarologisch, Aanteekeningen, LXXIV*;

Ent. Bericht. 6: 258;
Rhizoglyphus feculae Oudemans, 1937, Kristisch Historisch
Overzicht der Acarologie, Brill. Leiden. Vol 3 E pp. 2061 (Misidentification);


Rhizoglyphus robini (Claparede) Van Eyndhoven, 1961, XI. Int. Kongress Fur Entomologe 1 : 274- 276;

Rhizoglyphus robini (Claparede) Manson, 1972, Acarologia, t. XIII, fasc. 4 : 630-633.

This species is being recorded for the first time from India.

F E M A L E :

Colour : White.

Dimensions: Body 755 µ long ; 535 µ wide.
Gnathosoma: Chelicerae shows a basal swollen portion, upper fixed digit and a movable digit. A mandibular spine present below the fixed digit.

Dorsum: Propodosoma bears a Grandjean's organ without a distal bifurcation. Measurements of setae:
- internal vertical setae (v.i) 95 μ
- external vertical setae (v.e) 8 μ
- external scapular setae (Sc.e) 195 μ
- internal scapular setae (Sc.i) 12 μ
- Supra scapular seta, slender 27 μ long.

Measurements of hysterosomal setae: dorsal setae:
- d₁ 17 μ; d₂ 18 μ; d₃ 72 μ; d₄ 155 μ
- internal humerals (h.e) 145 μ
- lateral setae la 22 μ; lp 102 μ
- inner sacrals (sa.i) 135 μ
- outer sacrals (Sa.e) 95 μ
- post anal setae (pa) 145 μ.

Venter: Setae fewer than dorsum. Ventral humerals (h.v) 21 μ long arise at anterior lateral margin. A narrow canal leads to seminal receptacle.

Legs: Four pairs. Setation is similar to that of male.

MALE:

Dimensions: Body 543 μ long; 395 μ wide.

Dorsum: Measurements of propodosomal setae:
- v.i. 95 μ; v.e. 6 μ; Sc.e 185 μ; sc.i 11 μ
- Supracoxal seta 21 μ long. Grandjean's organ without a distal bifurcation.
Measurements of hysterosomal setae: \(d_1 18 \mu; d_2 23 \mu; d_3 71 \mu; d_4 105 \mu; h.1 18 \mu; h. e 145 \mu; h. v 24 \mu; la 22 \mu; l p 156 \mu; Sa. e 143 \mu; Sa._l 165 \mu.\) Penis is conical shaped and narrow.

**Legs:**

Four pairs. Three distal setae on tarsus Ist - tarsus 3rd thickened apically. Setae on the legs Ist - 4th are: coxae 1-1-1-0; Femora 1-1-0-1; genua 2 sole. + 2 - 1 sole. + 2 - 1 sole. + 1 - 0; tibia 2 + 1 sole. - 2 + 1 sole. - 1 sole. + 1 spine -1 sole. + 1 spine; tarsi 4 + 3 sole. + 5 spines + conical spine + famulus -4 + 2 sole. + 6 spines - 3 + 6 spines -1 + 7 spines.

**Heteromorphic Male:**

Body 585 \(\mu\) long; 410 \(\mu\) wide. Grandjean's organ with a distinct distal bifurcation. Leg 3rd enlarged having femur 103 \(\mu\) long; 85 \(\mu\) wide and tarsus with a strong claw.

**Hypopus:**

Oval shaped. Body smaller in size (285 \(\mu\) long). Mouth parts are lacking. Ventrally gnathosoma is constituted of a simple plate with elongate lobes. Each lobe bears a long apical seta. A sucker plate on
the posterior end of venter, bears two large central suckers surrounded by several smaller one's. Legs taper distally and leaf like setae are present at the distal end of tarsi.

LOCALITIES AND HOST RANGE


ECONOMIC IMPORTANCE: - Mite attacks the bulbs of onion and mushrooms in the field and in storage. Due to feeding activity of mites the bulbs are rotten. In storage 30-80% damage of the bulbs was observed.

BIOLOGICAL NOTE: High infestation of this mite was observed at 27.4°C maximum and 11.6°C minimum temperatures in August on Allium. About 50-200 mites were collected from a single bulb under severe infestations. A predatory mite Cheyletus sp. was seen preying upon this mite in the storage.

DISTRIBUTION

WORLD: - U.S.A; Japan; Australia; Holland; Greece; Newzealand.
Rhizoglyphus singularis (Manson 1972)


This species is being recorded for the first time from North western Himalayan region.

DIAGNOSTIC CHARACTERS: Whitish mite. Body of female 785 μ long; 552 μ wide. Lateral setae (la) of female close to the latero-abdominal gland and internal scapular setae (Sc. i) are comparatively long. Male bears radiating lines comparatively less on the anterior part of anal discs.

LOCALITIES AND HOST - RANGE

KASHMIR: Dioscorea deltoids, Dachigam, 23.IX.1978; Forest litter, Uri, 1.XI. 1977.

ECONOMIC IMPORTANCE: The mite was seen attacking the roots of yams (medicinal plant) in the forests. Due to feeding of this mite roots were damaged which resulted in stunting of growth.
BIOLOGICAL NOTE: High populations of this mite were seen in July - August in the field.

DISTRIBUTION: India.

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KEY TO SPECIES OF RHIZOGLYPHUS BASED ON FEMALES

1. Six pairs of small anal setae present.
   Setae Sc. i short (12 u) ................
   Rhizoglyphus robin (Claparede)
   Setae Sc. i very long (42 u) ................. 2

2. Body seta la adjacent to opening of lateroabdominal gland
   Rhizoglyphus singularis (Manson)

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PLATE XXIII

EXPLANATION OF THE FIGURES

*Rhizoglyphus robini* (Claparede)

Heavy infestation of *Rhizoglyphus robini* on *Allium* bulbs.
PLATE XXIV

EXPLANATION OF THE FIGURES

Rhizoglyphus robini (Claparede)

1. Dorsum of female.
2. Hypostome of female.
3. Venter of female.
4. Lateral sclerite and Grandjean's organ(♀).
Rhzoglyphus robini (Claparede)

1. Leg 1st (Male).
2. Leg 2nd (Male).
3. Leg 3rd (Male).
4. Leg 4th (Male).
5. Genital area (Male).