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Diversity of Aphids (Homoptera: Aphididae) Infesting Polygonaceous Plants (Angiospermae: Caryophyllales: Polygonaceae) in India

Singh Rajendra^{1*} and Agrawal Ruhi²

¹Department of Zoology, Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur (U.P.), India

²Department of Zoology, St. Joseph's College for Women, Gorakhpur (U.P.), India

*Corresponding author

Abstract: The present checklist demonstrates that at least 30 species of plants of the family Polygonaceae are infested by 75 species/subspecies of aphids belonging to 4 subfamilies, such as Aphidinae (Tribe Aphidini: 19 species; Tribe Macrosiphini: 53 species), and Eriosomatinae, Greenideinae and Lachninae (1 species each) in India. Maximum number of aphid species (21 aphid species) are colonised on *Persicaria nepalensis* and *Rumex nepalensis* (16 species each), *Polygonum punctatum* (12 species), *Persicaria barbata* and *Persicaria chinensis* (11 species each), and *Persicaria decipiens* (10 species) and less number of species on rest of the plant species. Similarly, maximum number of plant species (14 plant species) were colonised by *Aphis* (*Aphis*) *gossypii* Glover followed by *Capitophorus hippophaes javanicus* Hille Ris Lambers (12 plant species), *Capitophorus mitegoni* Eastop (11 plant species), *Aphis* (*Aphis*) *spiraecola* Patch (9 plant species), *Akkaia bengalensis* Basu (8 plant species), *Myzus* (*Nectarosiphon*) *persicae* (Sulzer) (8 plant species), *Trichosiphonaphis* (*Xenomyzus*) *polygoni* (van der Goot) (8 plant species), *Myzus* (*Myzus*) *ornatus* Laing (7 plant species), *Aphis* (*Aphis*) *craccivora* Koch and *Aphis* (*Aphis*) *fabae* Scopoli (5 plant species each) and less than 5 plant species in case of other aphid species.

Keywords: Polygonaceae, Aphididae, Aphids, Buckwheat, Docks, Sorrels, Pests

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Introduction

The aphids (Insecta: Homoptera: Aphididae) are small sized (0.7- 7.0 mm in length), sap sucking insects and out of about 5110 species known worldwide about 1000 species are pestiferous to several crops throughout the world (Singh and Singh, 2019). Thelytokous parthenogenetic viviparity, complex life-cycles with alternation of sexual and asexual generations, host plant alternation, polymorphism, short and telescopic generations are major traits that make aphids highly prolific in reproduction (Singh and Ghosh, 2002; Singh and Singh, 2016a). The aphids also excrete honeydew, a characteristic sugary

substance, which serves as food for several other insects such as wasps, butterflies, moths and ants (Singh *et al.*, 2000). Aphids also transmit viral diseases to several crops that necessitate crop management strategies against them. Although aphids are the pest of crops, they are extremely important hosts for a number of parasitoids, predators, and an essential meal for numerous other insects, as well as birds (Singh and Singh, 2021).

Polygonaceae is one of the family of flowering plants, commonly known as the knotweed or smartweed-buckwheat family. The family comprises 1384 species of 59 genera

distributed globally (TPL, 2021) and in India, 121 species belonging to 12 genera are distributed mainly in the Ganga-Brahmaputra Plains, Himalayas and sub-Himalayan moist areas (Srivastava, 2014). The plants of the family are highly diversified being annual or perennial herbs, shrubs to lianas and trees. The buckwheat is an important crop cultivated as a dicot nutria-cereal (very distinct from monocot cereals) in Himalayan hills in India and Nepal as well as cover crop to smother weeds and improve the soil fertility. Also, the grain is highly nutritious and has medicinal property.

Probably, Ghulam-Ullah (1940) was first to record an aphid, *Aphis (Aphis) gossypii* Glover on unidentified *Fagopyrum* sp. from Delhi (India) followed by David (1957) on *Antigonon leptopus* and *Myzus (Myzus) ornatus* Laing on *Rumex acetosella* by David (1958). Thereafter, several workers particularly the team of Zoological Survey of India, Kolkata and others efforted in documenting the aphids on these plants. Raychaudhury (1983) was first to catalogue the food plants of Indian aphids. After almost two decades, Chakrabarti and Sarkar (2001) updated this catalogue. Later on, Singh G and Singh (2016a, 2017a-h, 2018) and Singh *et al.* (2018) updated the food plant checklists of aphid species recorded in India.

Materials and Methods

This checklist is based on the literature published in recent past books, journals and few authentic theses and websites up to 30 November, 2021. In the present checklist, attempts have been made to provide the valid scientific name of the aphids following Favret (2021) and <https://www.gbif.org>, and for the plants, following <https://www.gbif.org>, <http://www.ars-grin.gov>, and <http://www.theplantlist.org>. At several places, their synonymies were also mentioned.

Results and Discussion

The present checklist demonstrates that at least 30 species of plants of the family Polygonaceae are infested by 75 species/subspecies of aphids

belonging to 4 subfamilies, such as Aphidinae (Tribe Aphidini: 19 species; Tribe Macrosiphini: 53 species), and Eriosomatinae, Greenideinae and Lachninae (1 species each) in India. Maximum number of aphid species (21 aphid species) are colonised on *Persicaria nepalensis* and *Rumex nepalensis* (16 species each), *Polygonum punctatum* (12 species), *Persicaria barbata* and *Persicaria chinensis* (11 species each), and *Persicaria decipiens* (10 species) and less number of species on rest of the plant species.

Similarly, maximum number of plant species (14 plant species) were colonized by *Aphis (Aphis) gossypii* Glover followed by *Capitophorus hippophaes javanicus* Hille Ris Lambers (12 plant species), *Capitophorus mitegoni* Eastop (11 plant species), *Aphis (Aphis) spiraecola* Patch (9 plant species), *Akkaia bengalensis* Basu (8 plant species), *Myzus (Nectarosiphon) persicae* (Sulzer) (8 plant species), *Trichosiphonaphis (Xenomyzus) polygoni* (van der Goot) (8 plant species), *Myzus (Myzus) ornatus* Laing (7 plant species), *Aphis (Aphis) craccivora* Koch and *Aphis (Aphis) fabae* Scopoli (5 plant species each) and less than 5 plant species in case of other aphid species. Economic importance and food plant association of following aphid species that have been found to infest the plants belonging to Polygonaceae family has earlier been dealt by several workers, e.g. for *Aphis (Aphis) craccivora* Koch (Trivedi and Singh, 2014), *Aphis (Aphis) gossypii* Glover (Singh *et al.*, 2014), *Aphis (Aphis) spiraecola* Patch (Singh G and Singh, 2016b), *Myzus (Nectarosiphon) persicae* (Sulzer) (Singh *et al.*, 2015) and *Sitobion (Sitobion) miscanthi* (Takahashi) (Srivastava and Singh, 2014).

Following are the updated aphid wise as well as plant wise (subgeneric name of the aphids and author names are excluded) checklist of aphids infesting the plants belonging to the Polygonaceae in India.

I. Aphid wise-plant wise checklist

A. Subfamily: Aphidinae

I. Tribe: Aphidini

1. *Aphis (Aphis) craccivora* Koch, 1854

- *Antigonon leptopus* Hook. and Arn. (David, 1957; Behura, 1963)
- *Polygonum* sp. (Raychaudhuri, 1973; Ghosh and Agarwala, 1980)
- *Rumex acetosa* L. (Bhagat, 2012; Bhat, 2017; Bhat *et al.*, 2020)

• *Rumex acetosella* L. (Sary and Raychaudhuri, 1982)

• *Rumex nepalensis* Spreng. (Raychaudhuri, 1973; Singh *et al.*, 2003; Bhat *et al.*, 2020)

2. *Aphis (Aphis) fabae* Scopoli, 1763

- *Rumex acetosa* L. (Bhat, 2017)
- *Rumex acetosella* L. (Ghosh, 1977a; Singh *et al.*, 2003)
- *Rumex dentatus* L. (Chakrabarti, 1972; Singh *et al.*, 2003)
- *Rumex hastatulus* Baldwin (Raychaudhuri, 1973; Ghosh, 1977a)
- *Rumex nepalensis* Spreng. (Raychaudhuri, 1978; Singh *et al.*, 2003)
- *Rumex* sp. (Agarwala, 1979; Raychaudhuri, 1973)

3. *Aphis (Aphis) gossypii* Glover, 1877

- *Antigonon leptopus* Hook. and Arn. (David, 1957; Behura, 1963)
- *Fagopyrum acutatum* (Lehm.) Mansf. ex K. Hammer (= *Fagopyrum dibotrys* (D. Don) H. Hara, *Fagopyrum cymosum* (Trev.) Meisn) (Raychaudhuri, 1973)
- *Fagopyrum esculentum* Moench (Bhat *et al.*, 1986; Chakrabarti and Sarkar, 2001; Bhagat, 2012)
- *Fagopyrum kashmirianum* Munshi (Bhat *et al.*, 1986)
- *Fagopyrum tataricum* (L.) Gaertn. (Tahir *et al.*, 1985; Bhat *et al.*, 1986)
- *Fagopyrum* sp. (Ghulam-Ullah, 1940; Raychaudhuri, 1973)
- *Persicaria barbata* (L.) H. Hara (= *Polygonum barbatum* L.) (Raychaudhuri, 1973; Singh *et al.*, 2003)
- *Persicaria capitata* (Buch.-Ham. ex D. Don) H. Gross (= *Polygonum capitatum* Buch.-Ham. ex D. Don) (Chakrabarti, 1972)

• *Persicaria decipiens* (R.Br.) K.L. Wilson (= *Polygonum serrulatum* Lagasca) (Rao, 1969; Singh *et al.*, 2003)

• *Persicaria nepalensis* (Meisn.) Miyabe (= *Polygonum alatum* Buch.-Ham. ex D. Don) (Raychaudhuri, 1973; Chakrabarti and Sarkar, 2001)

• *Persicaria orientale* (L.) Spatch (= *Polygonum orientale* L.) (Behura, 1965; Singh *et al.*, 2003)

• *Polygonum pubescens* Blume (= *Polygonum flaccidum* Meisn.) (Raychaudhuri, 1973; Singh *et al.*, 2003)

• *Polygonum runcinatum* Buch.-Ham. ex D. Don (Agarwala, 1979; Singh *et al.*, 2003)

• *Polygonum* sp. (Ghosh and Agarwala, 1980; Raychaudhuri *et al.*, 1980)

• *Rumex nepalensis* Spreng. (Agarwala *et al.*, 1981; Singh *et al.*, 2003)

• *Rumex* sp. (Khan and Shah, 2017; Bhat *et al.*, 2020)

4. *Aphis (Aphis) longisetosa* Basu, 1969 (1970)

• *Polygonum* sp. (Raychaudhuri, 1973)

5. *Aphis (Aphis) nasturtii* Kaltenbach, 1843

- *Fagopyrum acutatum* (Lehm.) Mansf. ex K. Hammer (Maity *et al.*, 1980; Singh *et al.*, 2003)
- *Fagopyrum esculentum* Moench (Bhattacharya, 1990; Singh *et al.*, 2003)
- *Fagopyrum* sp. (Raychaudhuri, 1973; Rao and Kulkarni, 1977)

• *Persicaria nepalensis* (Meisn.) Miyabe (Chakrabarti and Sarkar, 2001)

• *Polygonum perfoliatum* L. (Raychaudhuri, 1973; Rao and Kulkarni, 1977; Ghosh, 1990)

• *Polygonum runcinatum* Buch.-Ham. ex D. Don (Agarwala, 1979; Ghosh, 1990)

• *Polygonum* sp. (Ghosh, 1990)

6. *Aphis (Aphis) nerii* Boyer de Fonscolombe, 1841

• *Rumex* sp. (Kar *et al.*, 1990)

7. *Aphis (Aphis) polygonacea* Matsumura, 1917

• *Rumex acetosella* L. (Ghosh, 1977a; Raychaudhuri, 1980; Singh *et al.*, 2003)

8. *Aphis (Aphis) rhoicola* Hille Ris Lambers, 1954

- *Rumex dentatus* L. (Rao, 1969; Singh *et al.*, 2003)
- *Rumex* sp. (David *et al.*, 1971; Ghosh, 1977a)

9. *Aphis (Aphis) rubifolii* (Thomas, 1879)

- *Rumex dentatus* L. (Chakrabarti *et al.*, 1971; Singh *et al.*, 2003)

10. *Aphis (Aphis) rumicis* Linnaeus, 1758

- *Rumex acetosella* L. (Ghosh, 1990; Singh *et al.*, 2003)
- *Rumex* sp. (Khan and Shah, 2017)

11. *Aphis (Aphis) solanella* Theobald, 1914

- *Rumex acetosella* L. (Bhat *et al.*, 2020)
- *Rumex nepalensis* Spreng. (Bhat *et al.*, 2020)
- *Rumex* sp. (Chakrabarti and Sarkar, 2001)

12. *Aphis (Aphis) spiraecola* Patch, 1914

- *Fagopyrum* sp. (Raychaudhuri, 1973; Ghosh and Agarwala, 1980)
 - *Persicaria barbata* (L.) H. Hara (Raychaudhuri, 1973; Singh *et al.*, 2003)
 - *Persicaria chinensis* (L.) H. Gross (Raychaudhuri, 1978; Singh *et al.*, 2003)
 - *Persicaria decipiens* (R.Br.) K.L.Wilson (Raychaudhuri, 1973; Singh *et al.*, 2003)
 - *Persicaria hydropiper* (L.) Delarbre (Raychaudhuri, 1978; Singh *et al.*, 2003)
 - *Persicaria nepalensis* (Meisn.) Miyabe (Raychaudhuri, 1973)
 - *Polygonum punctatum* Buch.-Ham. ex D. Don (Singh *et al.*, 2003)
 - *Polygonum* sp. (Ghosh and Agarwala, 1980; Raychaudhuri *et al.*, 1980)
 - *Rumex acetosella* L. (Bhalla, 1971; Bhalla and Pawar, 1980; Singh *et al.*, 2003)
 - *Rumex nepalensis* Spreng. (Raychaudhuri, 1973)
 - *Rumex* sp. (Chakrabarti and Sarkar, 2001)
- 13. *Aphis (Aphis) verbasci* Schrank, 1801**
- *Persicaria nepalensis* (Meisn.) Miyabe (Bhalla and Pawar, 1980; Chowdhuri *et al.*, 1969; Ghosh, 1977a)

- *Polygonum punctatum* Buch.-Ham. ex D. Don (Singh *et al.*, 2003)

14. *Aphis (Toxoptera) aurantii* (Boyer de Fonscolombe, 1841)

- *Fagopyrum* sp. (Rao and Kulkarni, 1977; Ghosh and Agarwala, 1980)
- *Persicaria barbata* (L.) H. Hara (Singh *et al.*, 2003)

15. *Aphis (Toxoptera) odinae* (van der Goot, 1917)

- *Fagopyrum* sp. (Raychaudhuri, 1973; Mondal *et al.*, 1976)
- *Persicaria amplexicaulis* (D.Don) Ronse Decr. (= *Polygonum amplexicaule* D. Don) (Raychaudhuri, 1973)

16. *Hyalopterus pruni* (Geoffroy, 1762)

- *Rumex* sp. (Chakrabarti *et al.*, 2002)

17. *Melanaphis arundinariae* (Takahashi, 1937)

- *Persicaria nepalensis* (Meisn.) Miyabe (Raha *et al.*, 1977)
- *Polygonum punctatum* Buch.-Ham. ex D. Don (Singh *et al.*, 2003)

18. *Rhopalosiphum maidis* (Fitch, 1856)

- *Polygonum runcinatum* Buch.-Ham. ex D. Don (Mondal *et al.*, 1978)

19. *Rhopalosiphum padi* (Linnaeus, 1758)

- *Polygonum* sp. (Raha *et al.*, 1977)

II. Tribe: Macrosiphini

20. *Acyrtosiphon (Acyrtosiphon) rubi* (Narzikulov, 1957)

- *Fagopyrum esculentum* Moench (Ghosh, 1974; David and Hameed, 1975)
- *Fagopyrum tataricum* (L.) Gaertn. (David and Hameed, 1975; Ghosh, 1977a)
- *Polygonum* sp. (Raychaudhuri *et al.*, 1980)
- *Rumex nepalensis* Spreng. (Chakrabarti *et al.*, 1971; Singh *et al.*, 2003)
- *Rumex* sp. (Raychaudhuri, 1980; Chakrabarti and Sarkar, 2001)

21. *Akkaia bengalensis* Basu, 1968

- *Koenigia mollis* (D.Don) T. M. Schust. and Reveal (= *Aconogonon molle* (D. Don). Don) H.

Hara; *Polygonum molle* D. Don.) (Raychaudhuri, 1973; Singh *et al.*, 2003)

- *Persicaria barbata* (L.) H. Hara (Ghosh *et al.*, 1971a; Raychaudhuri, 1973; Singh *et al.*, 2003)
- *Persicaria glabra* (Willd.) M. Gómez (= *Polygonum glabrum* Willd.) (Raychaudhuri, 1973; Singh *et al.*, 2003)
- *Persicaria nepalensis* (Meisn.) Miyabe (Ghosh *et al.*, 1971a; Raychaudhuri, 1973)
- *Polygonum microcephalum* var. *sphaerocephalum* (Wall. ex Meisner.) (= *Polygonum sphaerocephalum* Wall. ex Meisner.) (David, 1969)
- *Polygonum perfoliatum* L. (Raychaudhuri, 1973)
- *Polygonum punctatum* Buch.-Ham. ex D. Don (Raychaudhuri, 1973; Singh *et al.*, 2003)
- *Polygonum* sp. (Raychaudhuri, 1973; Raychaudhuri, 1980)
- *Rumex* sp. (Raychaudhuri, 1973; Ghosh *et al.*, 1976)

22. *Akkaia neopolygoni* Ghosh, Ghosh and Raychaudhuri, 1970

- *Koenigia mollis* (D. Don) T. M. Schust. and Reveal (Ghosh *et al.*, 1971a; Raychaudhuri, 1973; Singh *et al.*, 2003)
- *Persicaria decipiens* (R. Br.) K. L. Wilson (Ghosh *et al.*, 1971b; Raychaudhuri, 1973; Singh *et al.*, 2003)
- *Polygonum* sp. (Ghosh *et al.*, 1971b, 1976)

23. *Anaulacorthum fagopyri* (Ghosh and Raychaudhuri, 1972)

- *Fagopyrum acutatum* (Lehm.) Mansf. ex K. Hammer (Ghosh and Raychaudhuri, 1972; Singh *et al.*, 2003)

24. *Aulacorthum (Aulacorthum) nipponicum* (Essig and Kuwana, 1918)

- *Fagopyrum* sp. (Raychaudhuri, 1973)
- *Polygonum* sp. (Ghosh, 1977a)

25. *Aulacorthum (Aulacorthum) solani* (Kaltenbach, 1843)

- *Fagopyrum acutatum* (Lehm.) Mansf. ex K. Hammer (Raychaudhuri, 1980; Singh *et al.*, 2003)

26. *Brachycaudus (Brachycaudus) helichrysi* (Kaltenbach, 1843)

- *Persicaria barbata* (L.) H. Hara (Agarwala, 1979; Singh *et al.*, 2003)
- *Persicaria chinensis* (L.) H. Gross (Raychaudhuri, 1973; Singh *et al.*, 2003)
- *Polygonum* sp. (Chakrabarti, 1972; Raychaudhuri, 1973)
- *Rumex nepalensis* Spreng. (Agarwala, 1979; Singh *et al.*, 2003)

27. *Brachycaudus (Thuleaphis) amygdalinus* (Schouteden, 1905)

- *Fagopyrum acutatum* (Lehm.) Mansf. ex K. Hammer (Chakrabarti *et al.*, 1972; Singh *et al.*, 2003)

28. *Brachycaudus (Thuleaphis) rumexicolens* (Patch, 1917)

- *Fagopyrum acutatum* (Lehm.) Mansf. ex K. Hammer (Chakrabarti *et al.*, 1971; Singh *et al.*, 2003)
- *Rumex hastatulus* Baldwin (Ghosh, 1977a; Bhalla and Pawar, 1980)
- *Rumex nepalensis* Spreng. (Ghosh, 1977a; Singh *et al.*, 2003)
- *Rumex* sp. (Khan and Shah, 2017)

29. *Capitophorus elaeagni* (del Guercio, 1894)

- *Polygonum viscosum* Buch.-Ham. ex D. Don (Raychaudhuri, 1973)

30. *Capitophorus formosartemisiae* (Takahashi, 1921)

- *Polygonum* sp. (Raychaudhuri, 1973)

31. *Capitophorus himachali* Chakrabarti and Maity, 1980

- *Polygonum* sp. (Chakrabarti and Maity, 1980)

32. *Capitophorus himalayensis* Ghosh, Ghosh and Raychaudhuri, 1971

- Unidentified sp. (Basu and Raychaudhuri, 1976a)

33. *Capitophorus hippophaes* (Walker, 1852)

- *Persicaria barbata* (L.) H. Hara (Ghosh *et al.*, 1971c)

- *Persicaria chinensis* (L.) H. Gross (= *Polygonum chinense* L.) (Ghosh and Raychaudhuri, 1962; Singh *et al.*, 2003)
- *Persicaria hydropiper* (L.) Delarbre (Verma, 1965; Singh *et al.*, 2003)
- *Polygonum* sp. (Rao, 1969)

34. *Capitophorus hippophaes javanicus* Hille Ris Lambers, 1953

- *Koenigia mollis* (D. Don) T. M. Schust. and Reveal (Agarwala, 1979; Singh *et al.*, 2003)
- *Persicaria barbata* (L.) H. Hara (Chakrabarti *et al.*, 1971; Raychaudhuri, 1973, 1980; Singh *et al.*, 2003)
- *Persicaria chinensis* (L.) H. Gross (Raychaudhuri, 1978; Singh *et al.*, 2003)
- *Persicaria decipiens* (R.Br.) K.L. Wilson (Raychaudhuri, 1973, 1980; Singh *et al.*, 2003)
- *Persicaria glabra* (Willd.) M. Gómez (Basu and Raychaudhuri, 1976a; Raychaudhuri, 1980; Singh *et al.*, 2003)
- *Persicaria hydropiper* (L.) Delarbre (Raychaudhuri, 1973, 1980; Singh *et al.*, 2003)
- *Persicaria nepalensis* (Meisn.) Miyabe (Basu and Raychaudhuri, 1976a; Raychaudhuri, 1980)
- *Persicaria orientale* (L.) Spatch (Agarwala and Raychaudhuri, 1981; Singh *et al.*, 2003)
- *Polygonum paniculatum* L. (Ghosh and Basu, 1997)
- *Polygonum perfoliatum* L. (Raychaudhuri, 1973; Basu and Raychaudhuri, 1976a)
- *Polygonum pubescens* Blume (Chakrabarti and Raychaudhuri, 1975; Singh *et al.*, 2003)
- *Polygonum punctatum* Buch.-Ham. ex D. Don (Singh *et al.*, 2003)
- *Polygonum* sp. (Ghosh, 1977a; Raychaudhuri, 1980)

35. *Capitophorus mitegoni* Eastop, 1956

- *Koenigia mollis* (D. Don) T. M. Schust. and Reveal (Basu and Raychaudhuri, 1976a; Raychaudhuri, 1973, 1980; Singh *et al.*, 2003)
- *Persicaria barbata* (L.) H. Hara (Agarwala, 1979; Singh *et al.*, 2003)
- *Persicaria chinensis* (L.) H. Gross (= *Polygonum sinensis* P.E. Resertratol (Raychaudhuri, 1978, 1980; Singh *et al.*, 2003)

- *Persicaria glabra* (Willd.) M. Gómez (Raychaudhuri, 1973; Singh *et al.*, 2003)
- *Persicaria hydropiper* (L.) Delarbre (Ghosh, 1970; Ghosh, 1977b)
- *Persicaria nepalensis* (Meisn.) Miyabe (Basu and Raychaudhuri, 1976a; Raychaudhuri, 1973, 1980)
- *Persicaria orientale* (L.) Spatch (Raychaudhuri, 1973; Basu and Raychaudhuri, 1976a; Singh *et al.*, 2003)
- *Polygonum paniculatum* L. (Ghosh and Basu, 1997)
- *Polygonum perfoliatum* L. (Basu and Raychaudhuri, 1976a; Raychaudhuri, 1980)
- *Polygonum punctatum* Buch.-Ham. ex D. Don (Singh *et al.*, 2003)
- *Polygonum* sp. (Raychaudhuri, 1978, 1980)
- *Rumex nepalensis* Spreng. (Raychaudhuri, 1973, 1980; Singh *et al.*, 2003)
- *Rumex* sp. (Raychaudhuri, 1973)
- Unidentified sp. (Basu and Raychaudhuri, 1976a; Raychaudhuri, 1980)

36. *Cavariella (Cavariella) aegopodii* (Scopoli, 1763)

- *Polygonum* sp. (Raychaudhuri *et al.*, 1980)

37. *Coloradoa rufomaculata* (Wilson, 1908)

- *Polygonum* sp. (Raychaudhuri *et al.*, 1980)

38. *Dysaphis (cotoneasteria) microsiphon* (nevsky, 1929)

- *Polygonum polystachyum* Wall (Chakrabarti and Medda, 1993)
- *Rumex nepalensis* Spreng. (Chakrabarti and Medda, 1993; Singh *et al.*, 2003)

39. *Dysaphis emicis* (Mimeur, 1935)

- *Rumex nepalensis* Spreng. (Ghosh, 1969; Ghosh, 1977a; Singh *et al.*, 2003)
- *Rumex* sp. (David *et al.*, 1969; Ghosh, 1977a)

40. *Dysaphis foeniculus* (Theobald, 1923)

- *Polygonum* sp. (Chakrabarti and Medda, 1993)
- *Rumex nepalensis* Spreng. (Bhagat, 1981; Chakrabarti and Medda, 1993)
- *Rumex* sp. (Chakrabarti and Medda, 1993)

41. *Hyperomyzus (Hyperomyzus) carduellinus* (Theobald, 1915)

- *Rumex nepalensis* Spreng. (Singh *et al.*, 2003)

42. *Hyperomyzus (Hyperomyzus) lactucae* (Linnaeus, 1758)

- Unidentified species (Ghosh, 1977a)

43. *Impatientinum (Impatientinum) asiaticum dalhousiensis* Verma, 1969

- *Fagopyrum acutatum* (Lehm.) Mansf. ex K. Hammer (Chakrabarti, 1972; Singh *et al.*, 2003)
- *Rumex* sp. (Chakrabarti *et al.*, 1971, 1972b)

44. *Indomasonaphis rumicis* (Chakrabarti and Raychaudhuri, 1975)

- *Oxyria digyna* (L.) Hill (Singh *et al.*, 2003)

45. *Liosomaphis atra* Hille Ris Lambers, 1966

- *Polygonum* sp. (Ghosh, 1977a)

46. *Liosomaphis himalayensis* Basu, 1964

- *Fagopyrum* sp. (Maity and Chakrabarti, 1979)
- *Rumex* sp. (Chakrabarti *et al.*, 2002)

47. *Longisiphoniella subterranea* Chakrabarti, Saha and Mandal, 1984 (1988)

- *Rumex* sp. (Chakrabarti *et al.*, 1988)

48. *Macrosiphum (Macrosiphum) fagopyri* Ghosh and Raychaudhuri, 1972

- *Fagopyrum acutatum* (Lehm.) Mansf. ex K. Hammer (Raychaudhuri, 1980; Singh *et al.*, 2003)
- *Fagopyrum* sp. (Bhattacharya, 1990; Chakrabarti and Sarkar, 2001)

49. *Macrosiphum (Macrosiphum) pachysiphon* Hille Ris Lambers, 1966

- *Rumex hastatulus* Baldwin (Chowdhuri *et al.*, 1969; Ghosh, 1977a; Bhalla and Pawar, 1980)

50. *Macrosiphum (Macrosiphum) pseudogeranii* Chakrabarti and Raychaudhuri, 1974

- *Polygonum* sp. (Raychaudhuri *et al.*, 1980)

51. *Macrosiphum (Macrosiphum) rosae* (Linnaeus, 1758)

- *Fagopyrum* sp. (Raychaudhuri, 1973)
- *Persicaria decipiens* (R.Br.) K.L.Wilson (Raychaudhuri, 1973, 1980)

52. *Metopolophium* sp.

- *Rumex* sp. (Mondal *et al.*, 1976; Bhalla and Pawar, 1980)

53. *Micromyzodium* sp.

- *Polygonum* sp. (Basu *et al.*, 1973)

54. *Myzackaia polygonicola* Basu, 1969

- *Persicaria nepalensis* (Meisn.) Miyabe (Ghosh, 1977a; Chakrabarti and Sarkar, 2001)
- *Polygonum runcinatum* Buch.-Ham. ex D. Don (Basu, 1969a; Raychaudhuri, 1980)

55. *Myzackaia verbasci* (Chawdhuri Basu Chakrabarti and Raychaudhuri, 1969)

- *Persicaria chinensis* (L.) H. Gross (Raychaudhuri, 1973, 1980; Ghosh and Basu, 1997)
- *Persicaria decipiens* (R.Br.) K.L.Wilson (Raychaudhuri, 1973, 1980; Singh *et al.*, 2003)
- *Persicaria nepalensis* (Meisn.) Miyabe (Ghosh, 1977a; Ghosh and Basu, 1997)
- *Polygonum runcinatum* Buch.-Ham. ex D. Don (Raychaudhuri, 1973, 1980; Ghosh and Basu, 1997)
- *Polygonum* sp. (Raychaudhuri, 1973; Pramanik and Raychaudhuri, 1984)

56. *Myzus (Myzus) brevisiphon* Basu, 1969

- *Polygonum punctatum* Buch.-Ham. ex D. Don (Singh *et al.*, 2003)

57. *Myzus (Myzus) cerasi* (Fabricius, 1775)

- *Polygonum* sp. (Agarwala, 1979)

58. *Myzus (Myzus) dycei* Carver, 1961

- *Polygonum* sp. (Basu and Raychaudhuri, 1976b; Raychaudhuri, 1973, 1980)

59. *Myzus (Myzus) formosanus* Takahashi, 1923

- *Persicaria capitata* (Buch.-Ham. ex D. Don) H. Gross (Raychaudhuri, 1980; Chakrabarti *et al.*, 1988; Chakrabarti and Sarkar, 2001)
- *Persicaria nepalensis* (Meisn.) Miyabe (Agarwala, 1979)

- *Polygonum* sp. (Basu and Raychaudhuri, 1976b; Basu and Raychaudhuri, 1980)

60. *Myzus (Myzus) leptotrichus* David, Rajasingh and Narayanan, 1972

- *Persicaria barbata* (L.) H. Hara (Basu and Raychaudhuri, 1976b; Raychaudhuri, 1980)
- *Polygonum runcinatum* Buch.-Ham. ex D. Don (Basu and Raychaudhuri, 1976b; Raychaudhuri, 1973, 1980)

61. *Myzus (Myzus) ornatus* Laing, 1932

- *Fagopyrum* sp. (Ghosh and Agarwala, 1980; Raychaudhuri, 1973)
- *Persicaria chinensis* (L.) H. Gross (Raychaudhuri, 1973; Singh *et al.*, 2003)
- *Persicaria decipiens* (R.Br.) K.L.Wilson (Raychaudhuri, 1973; Singh *et al.*, 2003)
- *Persicaria nepalensis* (Meisn.) Miyabe (Raychaudhuri, 1973)
- *Polygonum punctatum* Buch.-Ham. ex D. Don (Singh *et al.*, 2003)
- *Polygonum* sp. (Ghosh and Agarwala, 1980; Ghosh, 1977a)
- *Rumex acetosella* L. (David, 1958; Singh *et al.*, 2003)
- *Rumex nepalensis* Spreng. (Ghosh, 1977a; Raychaudhuri, 1973)

62. *Myzus (Nectarosiphon) persicae* (Sulzer, 1776)

- *Antigonon leptopus* Hook. and Arn. (Raychaudhuri, 1973)
- *Fagopyrum* sp. (Raychaudhuri, 1973; Ghosh and Agarwala, 1980)
- *Persicaria nepalensis* (Meisn.) Miyabe (Raychaudhuri, 1973)
- *Polygonum perfoliatum* L. (Ghosh and Agarwala, 1985)
- *Polygonum punctatum* Buch.-Ham. ex D. Don (Singh *et al.*, 2003)
- *Polygonum* sp. (Ghosh and Agarwala, 1980, 1985)
- *Rumex acetosella* L. (Bhalla, 1971; Bhalla and Pawar, 1980)
- *Rumex dentatus* L. (Behura, 1963; Singh *et al.*, 2003)
- *Rumex nepalensis* Spreng. (Raychaudhuri, 1973, 1978)

63. *Neomasonaphis rumicis* (Chakrabarti and Raychaudhuri, 1975)

- *Oxyria digyna* (L.) Hill (Chakrabarti and Raychaudhuri, 1975; Basu and Raychaudhuri, 1980)

- *Rumex* sp. (Chakrabarti and Raychaudhuri, 1975; Basu and Raychaudhuri, 1980)

64. *Neomyzus circumflexus* (Buckton, 1876)

- *Fagopyrum* sp. (Raychaudhuri, 1973; Ghosh and Agarwala, 1980)
- *Persicaria glabra* (Willd.) M. Gómez (Raychaudhuri, 1973; Singh *et al.*, 2003)
- *Polygonum* sp. (Ghosh and Agarwala, 1980)
- *Rumex* sp. (Ghosh, 1977a; Bhalla and Pawar, 1980)

65. *Sappaphis* sp.

- *Cotoneaster bacillaris* Wall. ex Lindl. (= *Cotoneaster obtusus* Wall. ex Lindl.) (Ghosh *et al.*, 1986)

66. *Sinomegoura citricola* (van der Goot, 1917)

- *Polygonum* sp. (Ghosh *et al.*, 1971c)

67. *Sitobion (Sitobion) miscanthi* (Takahashi, 1921)

- *Persicaria capitata* (Buch.-Ham. ex D. Don) H. Gross (Chakrabarti and Raychaudhuri, 1975)
- *Persicaria chinensis* (L.) H. Gross (Behura, 1965; Ghosh and Raychaudhuri, 1962)

68. *Sitobion (Sitobion)* sp.

- *Koenigia mollis* (D. Don) T. M. Schust. and Reveal (Ghosh *et al.*, 1971a; Raychaudhuri, 1973, 1980)
- *Persicaria amplexicaulis* (D. Don) Ronse Decr. (Raychaudhuri, 1973, 1980; Ghosh, 1977a)
- *Persicaria barbata* (L.) H. Hara (Raychaudhuri *et al.*, 1980; Singh *et al.*, 2003)
- *Persicaria chinensis* (L.) H. Gross (Raychaudhuri, 1983; Singh *et al.*, 2003)
- *Polygonum polystachyum* Wall (Chakrabarti and Sarkar, 2001)
- *Polygonum* sp. (Ghosh, 1977a; Raychaudhuri *et al.*, 1980)
- *Rumex hastatulus* Baldwin (Ghosh, 1977a; Bhalla and Pawar, 1980)
- *Rumex* sp. (Chakrabarti, 1972)

69. *Trichosiphonaphis (Trichosiphonaphis) gerberae* Ghosh and Raychaudhuri, 1972

- *Persicaria decipiens* (R.Br.) K.L.Wilson (Raychaudhuri, 1980; Singh *et al.*, 2003)
- *Polygonum perfoliatum* L. (Raychaudhuri, 1973, 1978)
- *Polygonum* sp. (Chakrabarti, 1972; Raychaudhuri, 1980)

70. *Trichosiphonaphis (Trichosiphonaphis) polygoniformosana* (Takahashi, 1921)

- *Persicaria decipiens* (R.Br.) K.L.Wilson (Basu *et al.*, 1974)
- *Polygonum perfoliatum* L. (Basu, 1969b)
- *Polygonum* sp. (Basu *et al.*, 1974)

71. *Trichosiphonaphis (Xenomyzus) polygoni* (van der Goot, 1917)

- *Koenigia mollis* (D.Don) T. M. Schust. and Reveal (Basu *et al.*, 1976; Singh *et al.*, 2003)
- *Persicaria barbata* (L.) H. Hara (Raychaudhuri, 1973, 1980; Singh *et al.*, 2003)
- *Persicaria chinensis* (L.) H. Gross (Raychaudhuri, 1978; Singh *et al.*, 2003)
- *Persicaria decipiens* (R.Br.) K.L.Wilson (Raychaudhuri, 1973, 1980; Singh *et al.*, 2003)
- *Persicaria nepalensis* (Meisn.) Miyabe (Raychaudhuri, 1973, 1980)
- *Polygonum perfoliatum* L. (Raychaudhuri, 1973)
- *Polygonum punctatum* Buch.-Ham. ex D. Don (Singh *et al.*, 2003)
- *Polygonum* sp. (Basu *et al.*, 1976; Raychaudhuri, 1980)
- *Rumex nepalensis* Spreng. (Raychaudhuri, 1973, 1980; Singh *et al.*, 2003)

72. *Uroleucon (Uroleucon) fagopyri* (Chowdhuri, Basu, Chakrabarti and Raychaudhuri, 1969)

- *Fagopyrum acutatum* (Lehm.) Mansf. ex K. Hammer (Chowdhuri *et al.*, 1969; Ghosh, 1977a)
- *Fagopyrum* sp. (Basu *et al.*, 1973; Raychaudhuri, 1973)

73. *Vesiculaphis* sp.

- *Persicaria nepalensis* (Meisn.) Miyabe (Chowdhuri *et al.*, 1968)

- *Polygonum punctatum* Buch.-Ham. ex D. Don (Singh *et al.*, 2003)

2. Subfamily: Greenideinae

74. *Greenidea (Trichosiphum) bucktonis* Ghosh, Basu and Raychaudhuri, 1970

- *Persicaria chinensis* (L.) H. Gross (Raychaudhuri, 1973, 1980; Singh *et al.*, 2003)

3. Subfamily: Lachninae

75. *Protrama longitarsus sclerodensus* Kumar, 1973

- *Rumex* sp. (Ghosh, 1977a)

4. Subfamily: Eriosomatinae

76. *Epipemphigus imaicus* (Cholodkovsky, 1912)

- *Persicaria nepalensis* (Meisn.) Miyabe (Chakrabarti and Banerjee, 1993; Chakrabarti *et al.*, 2020)
- *Polygonum punctatum* Buch.-Ham. ex D. Don (Singh *et al.*, 2003)

II. Plant wise-aphid wise checklist

1. ***Antigonon leptopus*:** *Aphis craccivora*, *Aphis gossypii*, *Myzus persicae*
2. ***Cotoneaster bacillaris*:** *Sappaphis* sp.
3. ***Fagopyrum acutatum*:** *Anaulacorthum fagopyri*, *Aphis gossypii*, *Aphis nasturtii*, *Aulacorthum solani*, *Brachycaudus amygdalinus*, *Brachycaudus rumexicolens*, *Impatiens asiaticum dalhousiensis*, *Macrosiphum fagopyri*, *Uroleucon fagopyri*
4. ***Fagopyrum esculentum*:** *Acyrtosiphon rubi*, *Aphis gossypii*, *Aphis nasturtii*
5. ***Fagopyrum kashmirianum*:** *Aphis gossypii*
6. ***Fagopyrum tataricum*:** *Aphis gossypii*, *Acyrtosiphon rubi*
7. ***Fagopyrum* sp.:** *Aphis aurantii*, *Aphis gossypii*, *Aphis nasturtii*, *Aphis odinae*, *Aphis spiraeicola*, *Aulacorthum nipponicum*, *Liosomaphis himalayensis*, *Macrosiphum fagopyri*, *Macrosiphum rosae*, *Myzus ornatus*, *Myzus persicae*, *Neomyzus circumflexus*, *Uroleucon fagopyri*
8. ***Koenigia mollis*:** *Akkaia bengalensis*, *Akkaia neopolygoni*, *Capitophorus hippophaes javanicus*, *Capitophorus mitegoni*, *Sitobion* sp., *Trichosiphonaphis polygoni*

9. **Oxyria digyna:** *Indomasonaphis rumicis*, *Neomasonaphis rumicis*
10. **Persicaria amplexicaulis:** *Aphis odinae*, *Sitobion* sp.
11. **Persicaria barbata:** *Akkaia bengalensis*, *Aphis aurantii*, *Aphis gossypii*, *Aphis spiraeicola*, *Brachycaudus helichrysi*, *Capitophorus hippophaes*, *Capitophorus hippophaes javanicus*, *Capitophorus mitegoni*, *Myzus leptotrichus*, *Sitobion* sp., *Trichosiphonaphis polygoni*
12. **Persicaria capitata:** *Aphis gossypii*, *Myzus formosanus*, *Sitobion miscanthi*
13. **Persicaria chinensis:** *Aphis spiraeicola*, *Brachycaudus helichrysi*, *Capitophorus hippophaes*, *Capitophorus hippophaes javanicus*, *Capitophorus mitegoni*, *Greenidea bucktonis*, *Myzackaia verbasci*, *Myzus ornatus*, *Sitobion miscanthi*, *Sitobion* sp., *Trichosiphonaphis polygoni*
14. **Persicaria decipiens:** *Akkaia neopolygona*, *Aphis gossypii*, *Aphis spiraeicola*, *Capitophorus hippophaes javanicus*, *Macrosiphum rosae*,
15. *Myzackaia verbasci*, *Myzus ornatus*, *Trichosiphonaphis gerberae*, *Trichosiphonaphis polygoni*, *Trichosiphonaphis polygoniformosana*
16. **Persicaria glabra:** *Akkaia bengalensis*, *Capitophorus hippophaes javanicus*, *Capitophorus mitegoni*, *Neomyzus circumflexus*
17. **Persicaria hydropiper:** *Aphis spiraeicola*, *Capitophorus hippophaes*, *Capitophorus hippophaes javanicus*, *Capitophorus mitegoni*
18. **Persicaria nepalensis:** *Akkaia bengalensis*, *Aphis gossypii*, *Aphis nasturtii*, *Aphis spiraeicola*, *Aphis verbasci*, *Capitophorus hippophaes javanicus*, *Capitophorus mitegoni*, *Epipemphigus imaicus*, *Melanaphis arundinariae*, *Myzackaia polygonicola*, *Myzackaia verbasci*, *Myzus formosanus*, *Myzus ornatus*, *Myzus persicae*, *Trichosiphonaphis polygoni*, *Vesiculaphis* sp.
19. **Persicaria orientale:** *Aphis gossypii*, *Capitophorus hippophaes javanicus*, *Capitophorus mitegoni*
20. **Polygonum microcephalum** var. **sphaerocephalum:** *Akkaia bengalensis*
21. **Polygonum paniculatum:** *Akkaia bengalensis*, *Aphis nasturtii*, *Capitophorus hippophaes javanicus*, *Capitophorus mitegoni*, *Myzus persicae*, *Trichosiphonaphis gerberae*, *Trichosiphonaphis polygoni*, *Trichosiphonaphis polygoniformosana*
22. **Polygonum polystachyum:** *Dysaphis (cotoneasteria) microsiphon*, *Sitobion* sp.
23. **Polygonum pubescens:** *Aphis gossypii*, *Capitophorus hippophaes javanicus*
24. **Polygonum punctatum:** *Akkaia bengalensis*, *Aphis spiraeicola*, *Aphis verbasci*, *Capitophorus hippophaes javanicus*, *Capitophorus mitegoni*, *Epipemphigus imaicus*, *Melanaphis arundinariae*, *Myzus brevisiphon*, *Myzus ornatus*, *Myzus persicae*, *Trichosiphonaphis polygoni*, *Vesiculaphis* sp.
25. **Polygonum runcinatum:** *Aphis gossypii*, *Aphis nasturtii*, *Myzackaia polygonicola*, *Myzackaia verbasci*, *Myzus leptotrichus*, *Rhopalosiphum maidis*
26. **Polygonum viscosum:** *Aphis craccivora*, *Aphis fabae*, *Capitophorus elaeagni*
27. **Polygonum sp. :** *Acyrtosiphon rubi*, *Akkaia bengalensis*, *Akkaia neopolygona*, *Aphis craccivora*, *Aphis gossypii*, *Aphis longisetosa*, *Aphis nasturtii*, *Aphis spiraeicola*, *Aulacorthum nipponicum*, *Brachycaudus helichrysi*, *Capitophorus formosartemisiae*, *Capitophorus himachali*, *Capitophorus hippophaes*, *Capitophorus hippophaes javanicus*, *Capitophorus mitegoni*, *Cavariella aegopodii*, *Coloradoa rufomaculata*, *Dysaphis foeniculus*, *Liosomaphis atra*, *Macrosiphum pseudogeranii*, *Micromyzodium* sp., *Myzackaia verbasci*, *Myzus cerasi*, *Myzus dycei*, *Myzus formosanus*, *Myzus ornatus*, *Myzus persicae*, *Neomyzus circumflexus*, *Rhopalosiphum padi*, *Sinomegoura citricola*, *Sitobion* sp., *Trichosiphonaphis gerberae*, *Trichosiphonaphis polygoni*, *Trichosiphonaphis polygoniformosana*
28. **Rumex acetosa:** *Aphis craccivora*, *Aphis fabae*
29. **Rumex acetosella:** *Aphis craccivora*, *Aphis fabae*, *Aphis polygonacea*, *Aphis rumicis*, *Aphis solanella*, *Aphis spiraeicola*, *Myzus ornatus*, *Myzus persicae*
30. **Rumex dentatus:** *Aphis fabae*, *Aphis rhoicola*, *Aphis rubifolii*, *Myzus persicae*
31. **Rumex hastatulus:** *Aphis fabae*, *Brachycaudus rumexicolens*, *Macrosiphum pachysiphon*, *Sitobion* sp.

32. *Rumex nepalensis*: *Acyrtosiphon rubi*, *Aphis craccivora*, *Aphis fabae*, *Aphis gossypii*, *Aphis solanella*, *Aphis spiraeicola*, *Brachycaudus rumexicolens*, *Brachycaudus helichrysi*, *Capitophorus mitegoni*, *Dysaphis microsiphon*, *Dysaphis emicis*, *Dysaphis foeniculus*, *Hyperomyzus carduellinus*, *Myzus ornatus*, *Myzus persicae*, *Trichosiphonaphis polygoni*

33. *Rumex* sp.: *Acyrtosiphon rubi*, *Akkaia bengalensis*, *Aphis fabae*, *Aphis gossypii*, *Aphis nerii*, *Aphis rhoicola*, *Aphis rumicis*, *Aphis solanella*, *Aphis spiraeicola*, *Brachycaudus rumexicolens*, *Capitophorus mitegoni*, *Dysaphis emicis*, *Dysaphis foeniculus*, *Hyalopterus pruni*, *Impatientinum asiaticum dalhousiensis*, *Liosomaphis himalayensis*, *Longisiphoniella subterranean*, *Metopolophium* sp., *Neomasonaphis rumicis*, *Neomyzus circumflexus*, *Protrama longitarsus sclerodensus*, *Sitobion* sp.

34. Unidentified sp.: *Capitophorus himalayensis*, *Capitophorus mitegoni*, *Hyperomyzus lactucae*.

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