



Studies on family diatrypaceae (Sphaeriales, Fungi) from Punjab -1. genus *Valsa* fr.

Ramanjit Kaur

Assistant Professor, Department of Botany, Saroop Rani Government College for Women, Amritsar, Punjab, India

Abstract

Four species of the genus *Valsa* Fr. Namely *V. capillosa*, *V. himalayensis*, *v. nainitalensis* and *V. filiformis* are described and illustrated in this paper.

Keywords: Ascomycotina, diatrypaceae, *Valsa* fr.

Introduction

Diatrypoid fungi are those fungi which are characterised by having variously embedded perithecia in mixture of host and fungal tissue or in well-developed stroma that may be pulvinate, hemispherical or wide spreading, valsoid or Diatrypoid, creamish to brown and finally black. Perithecia with long necks, ostiolate, ostioles simple, clefted or perforated, rarely tending to be flattened or disc shaped, conical, hemispherical or elongated. Asci clavate to spindle shaped, long to short stipitate or even sessile, with generally refractive apical invagination, with amyloid or inamyloid apical rings, 8 spored or polysporous. Ascospores allantoid to sub allantoid, rarely cylindrical, hyaline to pale yellow and sometimes brown. Paraphyses filiform, generally, aseptate often disintegrating in mature perithecia.

In the present paper Diatrypoid fungi are treated in the family Diatrypaceae, Ascomycotina, Sphaeriales (Dennis 1978). These fungi are common throughout the world, occurring mostly on dead decaying woody substrata. Several species are known as plant pathogens and many others will probably be shown to be pathogenic. Despite the wide spread occurrence of its members, few studies have been done in the family Diatrypaceae in Punjab. The present paper is first in the series on the study of these fungi from Punjab.

Valsa Fries

Valsa Fr., sum. Veg. Scand. Sect. P. 410. 1849.

Stromata rudimentary or in the form of a mere web of hyphae in between the perithecial necks. perithecia clustered in small groups within dead bark, flask shaped with long necks converging and erumpent together, usually in a small grey pad of stromatic tissue, the ostiolar disc. Asci club shaped with 8 spores or less. Ascospores sausage shaped, colourless.

Substratum: On dead twigs and small branches of deciduous trees, shrubs and also on coniferous trees.

Type Species: *Valsa ambiens* (Pers.: Fr.) Fr. sum. Veg. Scand. Sect. P. 412. 1849.

The genus is cosmopolitan in its distribution and is represented by 60 species all over the world (Hawksworth *et al* 1983) [5]. In India it was previously represented by only 14 taxa (Bilgrami *et al* 1979, 81, Sarbhoy *et al* 1986, Dargan and Bhatia 1988) [1, 3, 6]. Only three species of *Valsa* are known from Punjab. In the present work four species are fully described and illustrated, out of which only one

species was previously reported from Punjab, where as, other three species *viz.*, *V. himalayensis*, *V. nainitalensis* and *V. floriformis* are new records for study area.

Key to the Species

1. Stromatic surface beset with crown of brown hairs.....2.
- 1'. Stromatic surface without hairs.....3.
- 2 (1) Stromatic disc well developed, stromata less than 1 mm across, spherical, hairs simple, septate, brown. Perithecia 1-6 per stroma, necks less protruding, ostioles 3-4 clefted to perforated, ascospores 3.3-5.0 × 1.2-1.66 µm, allantoid..... 1. *V. capillosa*
- 2'. Stromatic disc poorly developed, stromata up to 1.5 mm across, hemispherical, hairs simple to branched, septate brown, perithecia 2-12 per stroma, necks strongly protruding, ostioles conical, perforated, ascospores 3.2-5.0x 1.5 µm, allantoid.....2. *V. himalayensis*
- 3 (1') Stromata less than 1 mm long stromatic disc undifferentiated, texture prismatica. Perithecia 1-9 per stroma, less than 500µm in diameter, necks short, erect, ascospores 3.3-5.0 x 1.6 µm, allantoid..... 3. *V. nainitalensis*
- 3' Stromata more than 1 mm long, stromatic disc differentiated into zones, peripheral region textura angularis and central region textura intricata. Perithecia 3-19 per stroma more than 500 mm in diameter, necks long, ascospores 5-8.3 x 1.5 µm, allantoid.....4. *V. floriformis*

***Valsa capillosa* Dargan & Bhatia. Advances in Mycology.p.77.1988 [3].**

Plates 2, Figs. 1-7, 17, Fig.1, Map I.

Stromata erumpent, solitary, less than 1 mm across, spherical, black, represented by well developed disc; disc composed of textura angularis, cells 3.3-10.0 x 2.5-8.3 µm, thick walled, brown, beset with hairs, hairs simple, septate, brown. perithecia 1-6 per stroma, 320-572.0 × 256.0-640.0 µm, globose, necks 400.0-600.0 µm long, cylindrical, erect, less protruding, black, ostiolate; ostioles 3-4 clefted to perforated, perithecial wall 24.0-36.0 µm wide, textura angularis, differentiated into two regions, outer region 20.0-28.0 µm wide, cells 2.5-8.3 x 1.66-3.3 µm, thick walled, brown, inner zone 8.0- 16.0 µm wide, cells 13.3-33.2 x 3.3-4.1 µm, thin walled, hyaline. Asci 20.0-32.0 x 4.0-6.0 µm,

clavate, sessile, apex obtuse, apical ring absent, 8 spored, spores irregularly arranged. Ascospores 3.3-5 x 1.2-1.66 µm, allantoid, hyaline. Paraphyses disintegrated at maturity.

Specimen Examined

Punjab: Patiala: Chhatbir zoological park, on fallen dead angiospermous twigs, Ramanjit, PUN (1662), July 14, 1990; Deer Park, on fallen dead twigs, Ramanjit, PUN (1663), July 22, 1990; Chhatbir zoological Park, on fallen angiospermous twigs, M. Bhatia, PUN (949), August 8, 1983; on fallen twigs, S. Kaur, PUN (523), September 21, 1983.

Extralimital: Himachal Pradesh: Narkanda: Rampur road, on dead angiospermous wood, M. Bhatia, PUN (953) Holotypus, May 27, 1984. Dalhousie; on dead wood, Daljeet Singh, PUN (951), September, 1985.

Uttar Pradesh: Nainital: Bhim tal, on dead wood, M. Bhatia, PUN (950), September 19, 1982.

Remarks

The above-mentioned collection is characterised by having solitary, erumpent, depressed, spherical, black, stroma, represented by small stromatic disc bearing tufts of simple, septate, brown hairs and smaller allantoid ascospores. All these characters are typical of *Valsa capillosa* Dargan & Bhatia as described by Dargan and Bhatia (1988)^[3].

This species also resembles *V. himalayensis* Dargan & Bhatia having tufts of hairs and small ascospores but differ in having solitary, depressed, hemispherical stromata with simple disc and larger asci.

This species was previously reported by Dargan and Bhatia (1988) and is a second report from India.

***Valsa himalayensis* Dargan & Bhatia. Advances in Mycology. P. 78. 1988^[3].**

Plate:2, Figs.8-14,17, Fig.2, Map I.

Stromata erumpent to superficial, solitary, 0.5-1.5 x 0.5-1.5 mm, hemispherical, black, represented by poorly developed disc; disc upto 1 mm across, beset with tufts of stiff hairs, hairs 3.2-5 µm broad, simple to branched, septate, impregnated with very small black incrustations, dark

brown; disc composed of textura angularis, cells 2.40-5.0 x 3.2-6.4 µm, thick walled, dark brown. Perithecia 2-12 per stroma, 198.0-528.0 x 192.0-560.0 µm, ovate, deeply embedded in wood, necks 640.0-800.0 µm long, cylindrical, strongly protruded through stromatic disc, apex of the necks swollen, hairy, ostiolate, ostioles conical, perforated, perithecial wall 20.0-80.0 µm wide, textura angularis, differentiated into two regions, outer region 28.0-60.0 µm wide. Cells 3.2-16.0 x 3.2-18.0 µm, thick walled, dark brown; inner region 8-20.0 µm wide, cells 13.2-25.0 x 1.66-2.5 µm, thin walled, elongated, hyaline. Asci 16.0-24.0 x 4.0 µm, clavate, sessile, apex obtuse, apical ring absent, 8 spored, spores irregularly arranged. Ascospores 3.2-5.0 x 1.5 µm, allantoid hyaline. Paraphyses disintegrate at maturity.

Specimen Examined

Punjab: Patiala: Chhatbir zoological Park, on dead angiospermous twigs, Ramanjit, PUN (1664), July 14, 1990.

Extralimital: Himachal Pradesh: Dalhousie: Kalatope, on dead wood, M. Bhatia, PUN (955), Holotypus, September 15, 1983; on dead wood, Daljeet Singh, PUN (954), September, 1985.

Remarks

The main features of the above-mentioned collection are erumpent, hemispherical, black stroma which is represented by a poorly developed disc (1 mm across), beset with tufts of simple to branched septate, brown hairs, ostioles conical, perforated, short stipitate asci and small ascospores. All these characters are typical of *Valsa himalayensis* Dargan & Bhatia as described by Dargan and Bhatia (1988)^[3].

However, Punjab collection differs from the himalayan species in having solitary stroma, inconspicuous stromatic disc more perithecia per stroma and longer necks which are slightly swollen near the tip.

The species is close to *V. capillosa* Dargan & Bhatia in having crown of hairs and small ascospores. But there are marked differences that separates the above two species. Comparison of *V. himalayensis* and *V. capillosa* is given below.

V. himalayensis	V. capillosa
1. Stromata erumpent, solitary 0.5-1.5 x 0.5-1.5 mm, hemispherical, inconspicuous disc with tufts of brown hairs.	Stromata erumpent, solitary, less than 1 mm across, spherical, well developed disc with tufts of brown hairs.
2. Hairs simple to branched, septate, Impregnated with black incrustations, brown.	Hairs are simple, septate, and brown.
3. Perithecia 198.0-528.0 x 192.0-560.0 µm, ovate, 2-12 per stroma, necks 640.0-800.0 µm long, cylindrical.	Perithecia 320.0-570.0 x 256.0-640.0 µm, globose, 1-6 per stroma, necks 400-600 µm long, cylindrical.
4. Ostioles perforated	Ostioles clefted to perforated.
5. Asci 16.0-24.0 x 4.0-6.0 µm, clavate, sessile.	Asci 20.0-32.0 x 4.0 µm, clavate, sessile.
6. Ascospores 3.2-5.0 x 1.5 µm, allantoid.	Ascospores 3.3-5.0 x 1.2- 1.60 µm allantoid.

The species was previously reported from western Himalayas by Dargan and Bhatia (1988)^[3], however, for the study area, it is a new record.

***Valsa nainitalensis* Dargan & Bhatia. Advances in Mycology. P.77. 1988.**

Plates: 3, Figs.1-7, 17, Fig.3, Map I.

Stromata is erumpent, hemispherical, less than 1mm across, black, stromatic disc poorly developed, rarely well developed, not differentiated into zones, textura prismatic,

cells 3.3-10.0 x 3.3-4.0 µm, thick walled, brown. perithecia 1-9 per stroma, 352.0-400.0 x 352.0- 396.0 µm, subglobose, embedded in wood, necks 600.0 µm long. cylindrical, short, erect, shining black, ostiolate, ostioles simple to 3-5 clefted, perithecial wall 24-40 µm wide; textura angularis, differentiated into two regions; outer region 20.0-24.0 µm wide, cells 3.3-5.0 x 3.3-5.0 µm, thick walled, dark brown; inner region 8.0-20.0 µm wide, cells 14.5-30.0 x 1.66-3.3 µm, thin walled, hyaline, Asci 16.0-36.0 x 4.0 µm, clavate, short stipitate, apex obtuse, apical ring present, 8 spored,

spores irregularly arranged. Ascospores 3.3-5.0 x 1.66 µm, allantoid, hyaline. Paraphysis 1.0 µm wide, aseptate, hyaline.

Specimens Examined

Punjab: Patiala; Deer Park, on fallen dead twigs, Ramanjit PUN (1665), August 22, 1990.

Extralimital: Uttar Pradesh: Nainital; Tiffon Top, on dead angiospermous wood, M. Bahatia, PUN (956) Holotypus, September 4, 1981.

Mussoorie; Mossy fall, on dead pine wood, M. Bhatia, PUN (958) September 4, 1981.

Mussoorie; Mossy fall, on dead pine wood, M. Bhatia, PUN (958) September 18, 1985, on dead angiospermous wood, M. Bhatia, PUN (957) September 18, 1985.

Remarks

The unique features of the above-mentioned species are poorly developed, small, stromatic disc, fewer perithecia per stroma with short cylindrical necks, simple to clefted shining ostioles, sessile asci with smaller allantoid ascospores. All these features agree fully with *V nainitalensis* Dargan & Bhatia as described by Dargan and Bhatia 1988^[3].

The species was already reported from India by Dargan and Bhatia (1980). But it is a new record for the study area.

Valsa floriformis Ell. & Ev. Proc. Acad. Nat.sci. Phil.p.222, July 1890 in N. Am. Pyren. P. 465.1892.

Plates:4, Figs.1-7, 17, Fig.4, Map I

Stromata erumpent, 2-3 confluent in linear rows, 1.0-2.5 x 1.0 mm, less than 1 mm high, black, stromatic disc poorly to well developed, composed of two zones; peripheral zone with textura angularis, cells 2.5-8.3 x 3.3-8.3 µm, thick walled, brown; central zone textura intricata, hyphae 2.5-3.3

µm wide, septate, brown; stromatic tissue at the base of the perithecia scanty, hyphae penetrating host tissue, texture intricata, 1.5 µm, aseptate, thin walled, hyaline. Perithecia 3-19 per stroma, 400.0-608.0x 400.0-656.0 µm, globose, embeded in wood, neck, cylindrical, erect, exerted separately, less than 1 mm long, black, ostiolate; ostioles conical, 3 clefted to perforated. Perithecial wall 48.0- 88.0 µm wide, textura angularis, differentiated into two regions; outer region 40.0-80.0 µm wide, cells 2.5-6.67 x 1.66-4.1 µm, thick walled, dark brown; inner region 8.0-20.0 µm wide, cells 11.6-18.2 x 1.66 µm, thin walled, hyaline. Asci 20.0-24.0 x 5-6 µm clavate, sessile, spex somewhat truncate apical ring absent, 8 spored, spores irregularly arranged. Ascospores 5-8.3 x 1.5 µm, allantoid, hyaline. paraphyses disintegrate at maturity.

Specimens Examined

Punjab: Patiala: Deer Park, on fallen dead angiospermous twigs, Ramanjit, PUN (1666), July 22, 1990.

Extralimital: Uttar Pradesh: Nainital; Snow view, on dead wood, Daljeet Singh, PUN (934), October 15, 1985; Himachal pradesh: Shimla; Narkanda, on dead wood, M. Bhatia, PUN (933), September 22, 1982.

Remarks

These collections resemble *V. floriformis* Ell. & EV. and is characterised by having hemispherical to elliptical, erumpent stroma with brushy appearance due to long protruded cylindrical necks which are slightly swollen below tip, clefted ostioles, closely packed perithecia. All these collections are typical of *V. floriformis*. However, these Punjab collections differ in having slightly longer ascospores.

Previously, the species was reported from India by Dargan and Bhatia (1988)^[3]. However, it is new to the study area.

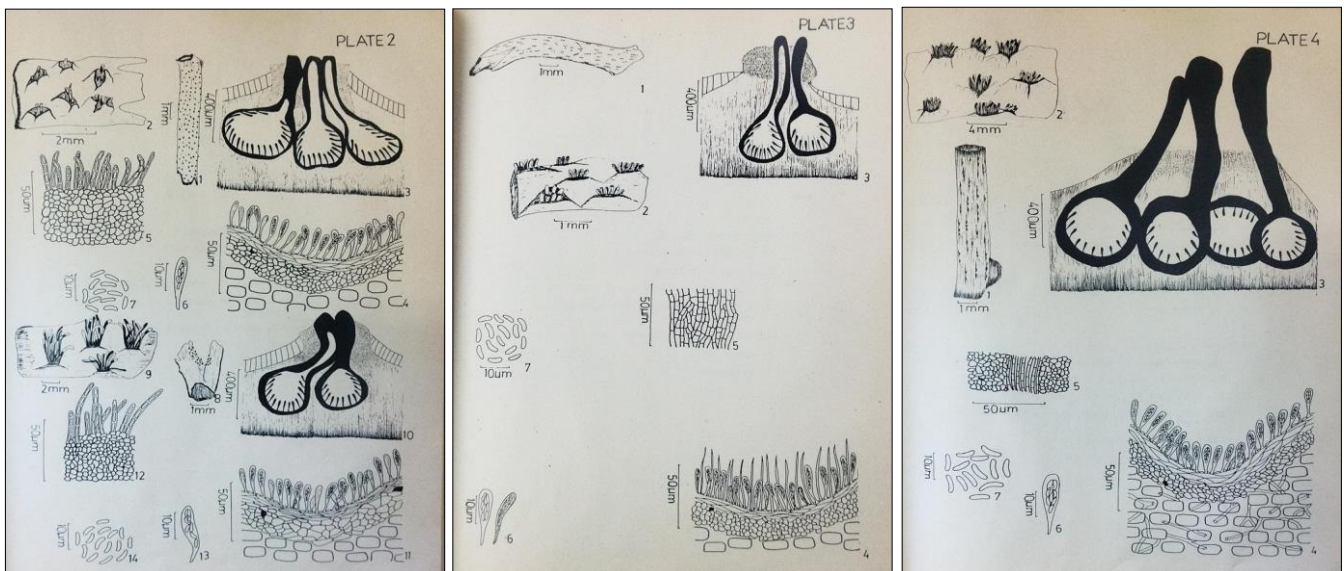


Plate 2

Plate 3

Plate 4

Plate-2

Figs.1-7. *Valsa capillosa*

1. Stromata general habit
2. Stroma enlarged
3. V.S. part of stroma showing various zones.
4. V.S. part of stroma showing detailed anatomy

5. V.S. part of stromatic disc

6. Ascus

7. Ascospores

Figs.8-14. Valsa himalayensis

8. Stromata general habit

9. Stromata enlarged
10. V.S. part of stroma showing various zones,
11. V.S. part of stroma showing detailed anatomy.
12. V.S. part of stromatic disc
13. Ascus
14. Ascospores

Plate-3

Figs.1-7. *Valsa nainitalensis*

1. Stromata general habit
2. Stroma enlarged
3. V.S. part of stroma showing various zones
4. V.S. part of stroma showing detailed anatomy
5. V.S. part of stromatic disc
6. Ascus
7. Ascospores

Plate-4

Figs.1-7. *Valsa floriformis*

1. Stromata general habit
2. Stromata enlarged
3. V.S. part of stroma showing various zones
4. V.S. part of stroma showing detailed anatomy.
5. V.S. part of stromatic disc
6. Ascus
7. Ascospores

Acknowledgements

Author is immensely thankful to Prof. (Dr.) J. S. Dargan eminent Plant Pathologist and Mycologist for his contribution in deciphering the novel fungi from Punjab

References

1. Bilgrami KS, Jamaluddin, Rizwi MA. Fungi of India. Part I. List and references. Today and Tomorrow's printers and publishers, New Delhi, 1979, 467.
2. Bilgrami KS, Jamaluddin, Rizwi MA. Fungi of India, Part II. Host Index and Addenda. Today and Tomorrow's printers and publishers, New Delhi, 1981, 128.
3. Dargan JS, Bhatia M. Some interesting species of *Valsa* Fr., Advances in Mycology, 1988, 75-86.
4. Advances and Trends held at Pb. Univ. from March 10-12, Abst. 16.p.10.
5. Hawksworth DL, Sutton BC, Ainsworth GC. Ainsworth and Bisby's dictionary of the fungi. 7th Ed. Comm. Mycol. Inst. Kew. Surrey, 1983.
6. Sarbhoy AK, Agarwal DK, Varshney JL. "Fungi of India" 1977-81. Associated publishing Company, New Delhi, 1986, 274.