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# The new system of family Woodsiaceae

# Новая система семейства Woodsiaceae

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***Key words***: *Woodsia*, new system, *Eriosoriopsis*, *Protowoodsia*, *Hymenocystis*, *Cheilanthopsis*, *Physematium*, *Woodsiopsis*.
***Ключевые слова***: *Woodsia*, новая система, *Eriosoriopsis*, *Protowoodsia*, *Hymenocystis*, *Cheilanthopsis*, *Physematium*, *Woodsiopsis*.

***Summary***. A new system of the family Woodsiaceae is proposed. A new genus *Woodsiopsis* is described and new combinations in the genera *Physematium*, *Eriosoriopsis*, and *Woodsiopsis* are validated. The systems of *Woodsia* and *Eriosoriopsis* are clarified and new intrageneric taxa in these genera are established.

***Резюме***. Предложена новая система семейства Woodsiaceae. Описан новый род *Woodsiopsis*, обнародованы новые комбинации в родах *Physematium*, *Eriosoriopsis* и *Woodsiopsis*. Уточнены системы родов *Woodsia* и *Eriosoriopsis*, в которых описаны новые внутриродовые таксоны.

The family Woodsiaceae (Diels) Herter which is accepted by the present (Shmakov, 1999, 2001, 2003, 2009a, b, 2011; Shmakov, Kiselev, 1995) and some other authors (Tzvelev, 1991, 2005; Christenhusz, Zhang, Schneider, 2011; Rothfels et al., 2012; Zhang, Kato et Shmakov, 2013) in the narrow sense, is continuously being in focus of many ptegidologists. A narrow taxonomic concept of the family is favored by molecular studies of two last decades (Rothfels et al., 2012). However, Woodsiaceae is still rather heterogenic morphologically (e. i., it includes taxa with and without stipe articulation, with different shape and dissection of indusia, etc.). Molecular phylogenetic studies of *Woodsia* s. l. reflects well this fact and demonstrate rather deep split between the Old World and predominantly New World clades (Rothfels et al., 2012; Larsson, 2014).

Having the above characters in mind, we consider it meaningful to divide Woodsiaceae onto two subfamilies (Shmakov, 2001): *Woodsioideae* Schmakov (stipe articulate or continuous, indusia membranous and marginal or divided into filiform segments) and *Protowoodsioideae* Schmakov (stipes continuous, indusia sphaerical or lobed). The first subfamily is widely distributed in Northern Hemisphere (Eurasia and North America) and comprises two genera (*Woodsia* R. Br., *Eriosoriopsis* (Kitag.) Ching & S. H. Wu). The second subfamily is represented by five genera (*Protowoodsia* Ching, *Hymenocystis* C. A. Mey., *Cheilanthopsis* Hieron., *Physematium* Kaulf., *Woodsiopsis* Schmakov) distributed primarily in the New World with fewer species in Africa, Madagascar, Caucasus, and East Asia.

*Woodsia* is the most difficult genus of the family with respect to both systematics and understanding its evolutionary history. Taxonomically valuable characters are degree of dissection and indumentum (including hairs and scales) of fronds as well as the form (oblique of almost perpendicular) and location (above, below, or near the middle of stipe) of the articulation. These characters were used by a number of authors (Nakai, 1925; Ching, 1932; Brown, 1964; Ma, 1985; Shmakov, Kiselev, 1995; Shmakov, 2001; Tzvelev, 2005) for intrageneric classification of *Woodsia*. The present system is also based on the

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characters of fronds (dissection, indumentum) and stipe articulation (form, location).

The new system of Woodsiaceae and some of its genera is presented below.

*Protowoodsioideae* Shmakov, 2001, Turczaninowia, 4 (1–2): 65. – Stipes continuous, indusia spherical or divided into lobes.

Type: *Protowoodsia* Ching

Five genera and about 23 species distributed mainly in the New World, fewer ones in Africa, Madagascar, the Caucasus and East Asia.

*Protowoodsia* Ching, 1945, Lingn. Sci. J. 21, 1–4: 36.

Type: *P. manchuriensis* (Hook.) Ching

One species in subtropical and partly temporate areas of East Asia.

*Hymenocystis* C. A. Mey, 1831, Verzeichn. Pl. Cauc: 229. – *Physematium* sect. *Hymenocystis* (C. A. Mey.) Tzvel., 2005, Novit. Syst. Pl. Vasc., 37: 34.

Type: *H. fragilis* (Trev.) A. Askerov (= *H. caucasica* C. A. Mey.)

One species in Caucasus.

*Cheilanthopsis* Hieron., 1920, Notizbl. Bot. Gard. Berlin-Dahlem, 7. 69: 409.

Type: *C. indusi*osa (H. Christ) Ching

Three species in Hymalaya and SW China (*C. indusiosa* (H. Christ) Ching, *C. elongata* (Hook.) Copel., *C. kangdingensis* (H. S. Kung, L. B. Zhang & X. S. Guo) Shmakov).

*Physematium* Kaulf. 1829, Flora 12: 341.

Type: *P. molle* Kaulf.

Five species distributed in Central and South America, Africa and Madagascar.

***Physematium angolensis*** (Schelpe) Shmakov, **comb. nov.** – *Woodsia angolensis* Schelpe, 1976, in Garcia de Orta, Sér. Bot. 3: 53. – Holotype: "Angola, Huíla, Lubango, Tundavala (Serra da Chela) ao quilòmetro 18 da escarpa rochosa junto à fends, 30 IV 1971 , *A. Borges 131*" (holotype – LISC; isotypes – COI, LUAI).

***Physematium burgessiana*** (Gerr. ex Hook. & Baker**)** Shmakov, **comb. nov. –** *Woodsia burgessiana* Gerr. ex Hook. et Baker, 1866, Synopsis filicum, 2: 48. – *Woodsia montividensis* (Spreng.) Hieron. var. *burgessiana* (Gerr. ex Hook. et Baker) Schelpe, 1969, J. S. Afr. Bot. 35: 138. – Type: "Natal, near the Tugela River, *Gerrard & McKen s.n*." (holotype – K 000351038; isotypes – S, SAM, TCD).

*Physematium canescens* (Kunze) Trevis., 1875, Nuovo Giorn. Bot. Ital. 7: 155. – *Woodsia canescens* (Kunze) Mett., 1864, Ann. Sci. Nat. Bot, sér. 5, 2: 249, Fig. 324L. – *Cheilanthes canescens* Kunze, 1839, Linnaea 13: 143.

*Physematium molle* Kaulf., 1829, Flora 12: 341.

***Physematium montividensis*** (Spreng.) Shmakov, **comb. nov**. – *Woodsia montividensis* (Spreng.) Hieron. 1896, Bot. Jahrb. 22: 363. – *Dicksonia montevidensis* Spreng., 1827, Syst. Veg., ed. 16, 4, 1: 122. – Type: "Monte Video, *Sello 517*" (B).

***Woodsiopsis*** Schmakov, **gen. nov.** – *Woodsia* subgen. *Perrinia* Hook. 1844, Sp. Fil. 1: 62, p.p. – Cespitose plants. Rhizomes short or creeping, erect or horizontal. Scales bicolor, with dark central stripe and pale brown margins. Stipes continuous. Indusium dissected almost to the base onto the blades or narrow, usually filiform segments. The basic chromosome number n=38.

Type: *W. obtusa* (Spreng.**)** Shmakov (*Woodsia obtusa* (Spreng.) Torrey)

10 species and 3 subspecies distributed in North America and Mexico.

***Woodsiopsis appalachiana*** (T. M. C. Taylor) Shmakov, **comb. nov**. – *Woodsia appalachiana* T. M. C. Taylor, 1947, Amer. Fern J. 37: 88. – Holotype: "USA. West Virginia: on a mountain 4 miles north of Old Sweet, 14 IX 1903, Steele & Steele 306" (holotype – GH; isotype – MO).

***Woodsiopsis cochisensis*** (Windham) Shmakov, **comb. nov**. – *Woodsia cochisensis* Windham, 1993, Contr. Univ. Michigan Herb. 19: 54, fig. 7. – Holotype: "USA. Arizona: Cochise Co., SE wall of Huachuca Canyon in the Huachuca Mts., ca. 2.85 km SE of Blacktail Spring, 6000 ft, 31 VIII 1985, M.D. Windham (781) & G. Yatskievych" (holotype – UT; isotypes – ARIZ, ASU, MICH, UC, US).

***Woodsiopsis cystopteroides*** (Windham et Mickel) Shmakov, **comb. nov.** – *Woodsia cystopteroides* Windham et Mickel, 2004, Mem. New York Bot. Gard. 88: 688, fig. 325 F-H, J-K. – Type: "Mexico. Sinaloa: Ocurahui, Sierra Surotato. Pine Forest, 6000–7001 ft.; igneous rocky slope in open Pine-Oak forest, 1–10 IX 1941 , Gentry 6432" (holotype – NY; isotypes – ARIZ, GH, MICH, PH).

***Woodsiopsis mexicana*** (Fée) Shmakov, **comb. nov.** – *Woodsia mexicana* Fée, 1857, Sept. Mem. Fam. Foug.: 66. – Type: "Mexico, San Angel, 1855, W. Schaffner 306 (?)".

***Woodsiopsis neomexicana*** (Windham) Shmakov, **comb. nov.** – *Woodsia neomexicana* Windham, 1993, Contr. Univ. Michigan Herb. 19: 52, fig.

6. – Type: "USA. New Mexico: Socorro Co., along small tributary of Water Canyon in the Magdalena Mountains ca. 5.84 km SE of the summit of North Baldy, 7050 ft, 23 VIII 1990, M.D. Windham (90–365) & E. Rahe" (holotype – UT; isotypes – ARIZ, ASU, BRY, COLO, GH, MICH, MO, NMC, NY, TEX, UC, UNM, US).

***Woodsiopsis obtusa*** (Spreng.) Shmakov, **comb. nov**. – *Woodsia obtusa* (Spreng.) Torr., 1840, New York State, Rep. Geol. Surv. 195. – *Polypodium obtusum* Sprengel, 1804, Anleit. Kenntn. Gew. 3: 93. – Type: "America septentr. Leg.: M. Kinn s.n." (B!).

***Woodsiopsis obtusa*** subsp. ***occidentalis*** (Windham) Shmakov, **comb. nov.** – *W. obtusa* subsp. *occidentalis* Windham, 1993, Contr. Univ. Michigan Herb. 19: 56. – Type: "USA. Texas: Llano Co., W side of Inks Lake, on hillside in granite area, 16 IV 1945, Lundell B484" (holotype – LL!; isotypes – LL! RM!).

***Woodsiopsis oregana*** (D. C. Eaton) Shmakov, **comb. nov.** – *Woodsia oregana* D. C. Eaton, 1865, Canad. Naturalist & Quart. J. Sci. n. s. 2: 90. – Type: "USA. Oregon: Dalles of the Columbia River, Major Raines in 1855" (lectotype – YU; isolectotypes – GH, K).

***Woodsiopsis oregana*** subsp. ***cathcartiana*** (B. L. Rob.) Shmakov, **comb. nov.** – *Woodsia oregana* subsp. *cathcartiana* (B. L. Rob.) Windham, 1933, Contr. Univ. Michigan Herb. 19: 58. – *Woodsia cathcartiana* B. L. Rob., 1908, Rhodora 10: 30. – Type: "USA. Minnesota: Taylor's Falls of the St. Croix River, 1874, Cathcart s.n." (holotype – GH!).

***Woodsiopsis phillipsii*** (Windham) Shmakov, **comb. nov.** – *Woodsia phillipsii* Windham, 1993, Contr. Univ. Michigan Herb. 19: 50, fig. 5. – Type: "USA. Arizona. Cochise Co.: Rucker Canyon, Chiricahua Mountains, canyon sides in pine woods, 6500 feet, 7 X 1945, Walter S. Phillips, 2854" (holotype – GH; isotypes – ARIZ, ASC, UBC, US).

***Woodsiopsis plummerae*** (Lemmon) Shmakov, **comb. nov.** – *Woodsia plummerae* Lemmon, 1882, Bot. Gaz. 7: 6. – Type: "USA: Arizona: Chiricahua Mts., 24 Sept 1881, Lemmon & Lemmon, 891" (RSA; UC; IT: F, GH, K, US).

***Woodsiopsis scopulina*** (D. C. Eaton) Shmakov, **comb. nov.** – *Woodsia scopulina* D. C. Eaton, 1865, Canad. Naturalist & Quart. J. Sci. 2: 91. – Type: "North America. USA. Colorado. Middle Park. C. C. Parry. 1861" (Syntype – YU); "USA. Flora Montium Scopulosorum, sub. lat. 39–41˚, Hall E. & Harbour J. P., 690b, 1862" (isosyntypes – UC, F).

***Woodsiopsis scopulina*** subsp. ***laurentiana*** (Windham) Shmakov, **comb. nov.** – *Woodsia scopulina* subsp. *laurentiana* Windham, 1993, Contr. Univ. Michigan Herb. 19: 59. – Type: "Canada. Quebec: Gaspe Co., Tourelle, on sandstone sea-cliffs, 19–21 VIII 1905, Collins & Fernald 25351" (holotype – GH!; isotypes – CAN! CAS! GA! GH! MICH! NY! POM! UC! US!).

*Woodsioideae* Shmakov, 2001, Turczaninowia, 4 (1–2): 65. – Stipes articulated or continuous. Indusium plate-like, dissected onto unequal parts or pinnatisect with filiform segments.

Type: *Woodsia* R. Br.

Two genera and about 36 species distributed mainly in Eurasia with few representatives in the north of North America.

*Woodsia* R. Br., 1810, Prodr. Fl. Nov. Holl.: 158.

Type: *W. ilvensis* (L.) R. Br.

About 28 species almost worldwide.

Subgen. *Acrolysis* (Nakai) Shmakov, 2003, Pteridol. New Millennium: 52. – Sect. *Acrolysis* Nakai, 1925, Bot. Mag. Tokyo, 39: 176.

Lectotype: *W. polystichoides* D. C. Eaton

Stipe with an oblique articulation.

Sect. *Acrolysis* Nakai, 1925, Bot. Mag. Tokyo, 39: 176. – Sect. *Intermediae* Fomin, 1934, Fl. URSS 1: 21, p. p. – Subsect. *Acrolysis* Nakai, 1925, Bot. Mag. Tokyo, 39: 176.

Lectotype: *W. polystichoides* D. C. Eaton

Stipe apically obliquely articulated. Indusium membranaceous, reduced to a rim, hairy at margin.

About 5 species distributed in East Asia (*W. macrochlaena* Mett. ex Kuhn, *W. oblonga* Ching et S. H. Wu, *W. polystichoides* D. C. Eaton, *W. pilosa* Ching, *W. subintermedia* Tzvel.).

Sect. ***Subcordatae*** (Shmakov) Shmakov, **comb. et stat. nov.** – Ser. *Subcordatae* Shmakov, 1995, Surv. Fam. Woods. Eur.: 41.

Type: *W. subcordata* Turcz.

Stipe obliquely articulated above the middle. Indusium dissected onto filiform segmrnts enveloping sorus.

Highly polymorphic section; ca. 5 species distributed in East Asia (*W. kitadakensis* Ohwi, *W. longifolia* Tagawa, *W. pseudoilvensis* Tagawa, *W. sinica* Ching, *W. subcordata* Turcz.).

Subgen. *Woodsia*. – Sect. *Woodsia* sensu Ma, 1985, Fern Gaz. 13, 1: 23, p. min. p. – Sect. *Eu-woodsia* Hook., 1844, Sp. Fil. 1: 63.

Type: *W. ilvensis* (L.) R. Br.

Stipe with a transverse articulation below or above the middle. Lobes pubescent with hairs and scales.

Sect. ***Woodsia***. – Sect. *Euwoodsia* Hook., 1844, Sp. Fil. 1: 63, pro subgen.

Type: *W. ilvensis* (L.) R. Br.

About 7 species distributed in the Northern Hemisphere (*W. acuminata* (Fomin) Sipl., *W. asiatica* Shmakov et Kiselev, *W. calcarea* (Fomin) Shmakov, *W. gorovoii* Krestsch. et Shmakov, *W. ilvensis* (L.) R. Br., *W. pseudopolystichoides* (Fomin) Kiselev et Shmakov, *Woodsia taigischensis* (Stepanov) Kuznetsov).

Sect. ***Alpinae*** (Shmakov) Shmakov **comb. et. stat. nov.** – Series *Alpinae* Shmakov, 1995, Surv. Fam. Woods. Eur.: 28.

Type: *W. alpina* (Bolt.) S. F. Gray

Four species, distributed in North America and mountains of Eurasia (*W. alpina* (Bolton) S. F. Gray, *W. himalaica* Ching et S. K. Wu, *W. intermedia* Rupr. (*W. gracilis* (Lawson) Butters), *W. pilosella* Rupr.).

Subgen. ***Glabellae*** (Shmakov) Shmakov, **comb. et stat. nov.** – *Woodsia* sect. *Woodsia* subsect. *Glabellae* Shmakov, 1995, Surv. Fam. Woods. Eur.: 46.

Type: *W. glabella* R. Br.

Stipe with a transverse articulation below or above the middle. Fronds glabrous or pubescent with short glandules or with soft hairs at the lower side.

Sect. *Glabellae* (Shmakov) Tzvel., 2005, Novit. Syst. Pl. Vasc., 37: 26. – *Woodsia* sect. *Woodsia* subsect. *Glabellae* Shmakov, 1995, Surv. Fam. Woods. Eur.: 46. – Subsect. *Ilvensis* Ching, 1932, Sinensia, 3, 5: 134, pro parte.

Type: *W. glabella* R. Br.

About 7 species distributed in the Northern Hemisphere.

Series *Glabellae* Shmakov, 2003, Pteridol. New Millennium: 54. – Fronds glabrous.

Typus: *W. glabella* R. Br.

Fronds glabrous.

About 5 species, distributed in the Northern Hemisphere (*W. asplenioides* Rupr., *W. glabella* R. Br., *W. hancockii* Bak., *W. heterophylla* (Turcz. ex Fomin) Shmakov, *W. pinnatifida* (Fomin) Shmakov).

**Series** *Pulchellae* Shmakov, **ser. nov.** – Fronds covered with short glands or at the lower side with soft hairs) – Plate operuit, cum brevibus glandulosis, sive molle fundo.

Type: *W. pulchella* Bertol.

Two species distributed in Europe and China (*W. pulchella* Bertol., *W. shensiensis* Ching).

*Eriosoriopsis* (Kitag.) Ching & S. H. Wu, 1991, Fern Fam. & Gen. China: 402.

Lectotype: *E. rosthorniana* Ching et S. H. Wu (=*Woodsia rosthorniana* Deils (=*W. jeholensis* Nakai et Kitag.))

Eight species distributed in the mountains of China, Himalayas and Taiwan.

Subgen. *Eriosoriopsis* – *Woodsia* sect. *Eriosoriopsis* Kitag., 1935, Rep. First. Sci. Expecl. Manchoukuo 4 (2): 48.

Lectotype: *E. rosthorniana* Ching et S. H. Wu (=*Woodsia rosthorniana* Deils (=*W. jeholensis* Nakai et Kitag.).

Sect. *Eriosoriopsis* – *Woodsia* sect. *Eriosoriopsis* Kitag., 1935, Rep. First. Sci. Expecl. Manchoukuo, 4 (2): 48. – *Woodsia* sect. *Rostornia* Tzvel. 2005, Novit. Syst. Pl. Vasc., 37: 38. – *Woodsia* subsect. *Rosthornianae* Shmakov et Kiselev, 1995, Surv. Fam. Woods. Eur.: 61.

Lectotype: *E. rosthorniana* Ching et S. H. Wu (=*Woodsia rosthorniana* Deils (=*W. jeholensis* Nakai et Kitag.)).

*E. rosthorniana* (Deils) Ching et S.H. Wu, 1991, Fern Fam. & Gen. of China 402. – *Woodsia rosthorniana* Deils, 1900, in Engl. Bot. Jahrb. Syst. 29 (2): 187. – Type: “Plantae chinensis in prov. Setchuen ab insolis collectae, C. Bock & A.V. Rosthorn (No. 34) 1764” (B).

***E. guizhouensis*** (P. S. Wang, Q. Luo & Li Bing Zhang) Shmakov, **comb. nov.** – *Woodsia guizhouensis* P. S. Wang, Q. Luo & Li Bing Zhang, 2012, Novon, 22 (2): 191, fig. 1, 2. – Type: “China. Guizhou: Bijie City, Yangjiawang, Gonglongping Forestry Center, among crevices on wet limes tone cliff, 27°12.92’N, 104°59.52’E, 1670 m, 21 XI 2008, Q. Luo 08301” (holotype – CDBI; isotypes – BJ, MO).

Subgen. ***Eriosorus*** (Ching) Shmakov, **comb. nov.** – *Woodsia* subgen. *Eriosorus* (Ching) Shmakov, 2003, Pteridol. New Millennium: 59. – *Woodsia* sect. *Eriosorus* Ching, 1932, Sinensia 3 (5): 134.

Lectotype: *E. lanosa* (Hook.) Shmakov (*Woodsia lanosa* Hook.)

Sect. ***Eriosorus*** (Ching) Shmakov, **comb. nov.** – *Woodsia* sect. *Eriosorus* Ching, 1932,

Sinensia 3 (5): 134. – Subsect. *Eriosorus* Shmakov et Kiselev, 1995, Surv. Fam. Woods. Eur.: 61.

Lectotype: *E. lanosa* (Hook.) Shmakov (*Woodsia lanosa* Hook.)

***E. andersoni*** (Bedd.) Shmakov, **comb. nov.** – *Woodsia andersoni* (Bedd.) Christ, 1905, Bull. Soc. Bot. France: Mem. 1: 45. – *Gymnogramma andersoni* Bedd., 1866, Ferns Brit. Ind. 2: 190, t. 190. – Type: "Kumaon. T. Anderson" (K).

***E. cinnamomea*** (Christ) Shmakov, **comb. nov.** – *Woodsia cinnamomea* Christ, 1906, Bull. Acad. Int. Geogr. Bot. 16: 122. – Type: "Western China. E. H. Wilson, 5369, July 1903" (P; isotype – K).

***E. cycloloba*** (Hand.-Mazz.) Shmakov, **comb. nov.** – *Woodsia cycloloba* Hand.-Mazz., 1929, Symb. Sinic. 6: 19, t. 1, f. 5. – Type: "NW – Yunnan: on granite and slate cliffs in Hg. St. of the Burmese Mountains under the Doker-la in the Mekong-Salwin chain, 28"15'. 4225 m., 17 Sept. 1915 H. Handel-Mazzetti, 8083" (W).

***E. lanosa*** (Hook.) Shmakov, **comb. nov.** – *Woodsia lanosa* Hook., 1868, Syn. Fil. 47. – *W. pellaeopsis* Hand.-Mazz., 1929, Symb. Sinic. 6: 18, t. I, f. 6. – Type: "Pindari. Kumaon. Elevation above the sea 12000 feet, R. Strachey and J. E. Winterbottom, N 2" (K).

***E. macrospora*** (C. Chr. et Maxon) Shmakov, **comb. nov.** – *Woodsia macrospora* C. Chr. et Maxon, 1927, J. Wash. Acad. Sci. l7(19): 499. – Type: "Kansu: Taochow. Garganar Gorge, 3600–4200 m. alt. R. C. Ching 906. August. 29. 1923" (PE; isotype? – US).

***E. okamotoi*** (Tagawa) Shmakov, **comb. nov.** – *Woodsia okamotoi* Tagawa, 1938, Acta Phylotax. Geobot. (Kyoto) 7: 185. – Type: "Formosa. Prov. Takao: Mt. Kwanzan ca 3700 m. 7 Oct. 1937, S. Okamoto" (KYO).

**Key to the genera**

1. Stipes articulate ..... ***Woodsia***
+ Stipes continuous ..... 2
2. Scales unicolored ..... 3
+ Scales bicolored with a darker middle part .... 4
3. Indusium spherical, more or less deeply, but not to the base, divided onto the blades ..... ***Physematium***
+ Indusium almost to the base dissected onto the blades or narrow, usually filiform segments ..... ***Woodsiopsis***
4. Indusia spherical, tearing when mature ..... 5
+ Indusium plate-like, dissected onto filiform lobes ..... ***Eriosoriopsis***
5. Lamina glabrous or with few glandular trichomes ..... ***Protowoodsia***
+ Lamina pubescent ..... 6
6. Pinnae of first range attenuate and acute; sori not covered with recurved lobe dens ..... ***Hymenocystis***
+ Pinnae of first range obtuse; sori slightly covered with recurved lobe dens .... ***Cheilanthopsis***

**Ключ для определения родов**

1. Черешки с сочленением ..... ***Woodsia***
+ Черешки без сочленения ..... 2
2. Чешуи одноцветные ..... 3
+ Чешуи двуцветные, с более темной серединой ..... 4
3. Индузии сферические, более или менее глубоко разорванные на лопасти, но не до основания ..... ***Physematium***
+ Индузии почти до основания рассечены на лопасти или на узкие, как правило, нитевидные сегменты ..... ***Woodsiopsis***
4. Индузии сферические, разрывающиеся по созревании ..... 5
+ Индузии пластинчатые, рассеченные на волосовидные доли ..... ***Eriosoriopsis***
5. Пластинки вай голые или с немногими железистыми волосками ..... ***Protowoodsia***
+ Пластинки вай опушенные ..... 6
6. Доли первого порядка сужающиеся и заостренные; сорусы не прикрыты завернутым краем листа ..... ***Hymenocystis***
+ Доли первого порядка тупые; сорусы прикрыты завернутым краем листа ..... ***Cheilanthopsis***

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