

The family Polygonaceae in West Africa: Taxonomic significance of leaf epidermal characters

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Abstract

Comparative studies have been carried out on the leaf epidermal features of the species in the family Polygonaceae in West Africa. Epidermal cells are mainly isodiametric in *Symmeria paniculata*, irregular or more often polygonal with curved, straight and undulate to sinuate anticlinal walls. A few species e.g. *Polygonum plebeium*, *Oxygonum sinuatum*, *Persicaria nepalensis* and *Harpagocarpus snowdenii* have striations on their epidermal walls. All species except *Afrobrunnichia erecta* and *H. snowdenii* are amphistomatic and the family is characterized by a wide range of stomata types such as the anisocytic in *P. plebeium*, cyclocytic in *S. paniculata* and a few *Persicaria*, anomocytic, diacytic, parallelocytic and paracytic which is regarded as the basic type for the family based on its widest occurrence among the species. However, different stomata types may occur on the same leaf surface. The unicellular, or multicellular, uniseriate aggregated trichomes are significant in the recognition of taxa in the *Persicaria* except in *P. senegalensis forma albotomentosa* which has short uniseriate flagelliform trichomes. The significance of these observations is discussed in relation to the taxonomy of the family.

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1. Introduction

Polygonaceae are a cosmopolitan family of herbs, shrubs, small trees or climbers characterized by simple leaves with sheathing ochrear stipules, unilocular ovary and endospermic seeds (Hutchinson and Dalziel, 1954; Brummitt, 1992). The family is generally considered to comprise 30 to 49 genera embracing about 750 species (Heywood, 1978; Brummitt, 1992). Most genera are restricted to the Northern temperate regions while others are tropical or subtropical (Heywood, 1978). Polygonaceae are poorly represented in West Africa, and Hutchinson and Dalziel (1954) recorded five genera and fifteen species for the West African sub-region. The genera include *Polygonum*, *Afrobrunnichia*, *Symmeria*, *Harpagocarpus* and *Rumex*. However, others such as *Oxygonum*, which is restricted to the northern part of Nigeria, and the widespread

Antigonon, have been collected and documented. The species occupy diverse ecological areas of the region ranging from lowland rainforests and highlands to savanna (Ayodele, 2003).

The classification of the Polygonaceae at and above the generic level has been unstable over the years. Until recently (Haraldson, 1978), the family was regarded as being made up of more than two subfamilies, with various authors differing in their circumscriptions of the subfamilies (Bentham and Hooker, 1880; Buchinger, 1957; Jaretzky, 1925; Takhtajan, 1980; Brandbyge, 1992). Haraldson (1978) recognised two subfamilies — the Polygonoideae based on *Polygonum* L. and the Eriogonoideae based on *Eriogonum* Mich. The tribal treatment of *Polygonum sensu lato* has itself been varied since the time of Linnaeus (1753) with several authors placing the segregate taxa contained into different tribes and subfamilies (Ronse Decraene and Akeroyd, 1988). However, Haraldson's (1978) proposed division of Polygoneae and Persicarieae brought order into the taxonomy of this group. Other tribes include the Rumiceae, Triplareae and the Coccolebeae.

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Table 1
List of specimens examined

Taxa	Locality	Collection(s)	Herbarium	Date
1. <i>Polygonum plebeium</i> R.Br.	Sokoto, Nigeria	M.G. Latilo	FHI 62592	20-7-69
	Bawku, Ghana	J.K. Morton	FHI 53461	25-12-54
	Katsina, Nigeria	Meikle	UIH 1224	3-4-50
2. <i>Oxygonum sinuatum</i> (Meissn.) Dammer	Borno State, Nigeria	Ekwuno and Fagbemi	FHI 94033	30-9-80
3. <i>Persicaria nepalensis</i> (Meissn.) Gross	Bamenda, Cameroon	J.K. Morton	FHI 53591	31-4-55
	Bamenda, Cameroon	B.O. Daramola	FHI 40624	23-1-59
	Mambilla, Nigeria	P.O. Ekwuno	FHI 77145	17-11-75
4. <i>Persicaria limbata</i> (Meissn.) Hara.	Obudu Nigeria	B.O. Daramola	FHI 62401	7-12-68
	Katagun, Nigeria	Dalziel, J.M	FHI 49877	1907
	Damaturu, Nigeria	E. Ujor	FHI 23909	16-7-48
5. <i>P. attenuata</i> (R.Br) Sojak. subsp. <i>pulchra</i> (Blume) K.L. Wilson	Oguta, Nigeria	Okafor and Enwiogbon	FHI 69335	26-1-74
	Tumu, Ghana	J.K. Morton	FHI 52100	30-3-53
	Maiduguri, Nigeria	Ujor	FHI 21928	24-6-49
6. <i>P. attenuata</i> (R.Br) Sojak. subsp. <i>africana</i> K.L. Wilson	Benin, Nigeria	Brenam and Jones	FHI 39382	25-12-47
	Nagodi, Ghana	J.K. Morton	FHI 53102	3-4-53
	Mambilla, Nigeria	G. Ibhanesebor	FHI 77873	26-11-75
	Mubi, Cameroon	P. Wit. and B.O. Daramola	FHI 78216	11-11-73
	Zaria, Nigeria	Ekwuno, Fagbemi, Odunewu and Ike	FHI 90865	16-6-76
	Benin, Nigeria	Onochie, C.F.A. and Ejiofor	FHI 27146	21-2-53
	Ibadan, Nigeria	Ayodele	UIH 22234	6-7-96
	Gongola, Nigeria	Ekwuno, P.O.	FHI 93199	11-2-80
	Gembu, Nigeria	M. Reekmans	FHI 98178	Feb. 1979
	Mambilla, Nigeria	Mark and de Leeuw	FHI 58775	16-8-66
8. <i>P. senegalensis</i> (Meissn.) Sojak f. <i>senegalensis</i>	Yola, Nigeria	Latilo M.G.	FHI 64717	3-12-71
	Bamenda, Cameroon	Hossain M.J.	FHI 43487	20-10-59
	Akure, Nigeria	Ayodele 013	UIH 22223	8-3-95
	Yola, Nigeria	Gbile, Wit and Daramola	FHI 65527	6-5-72
	Lagos, Nigeria	Ayodele 009	UIH 22223	3-7-94
9. <i>P. senegalensis</i> (Meissn.) Sojak f. <i>albotomentosa</i> (Graham) K.L. Wilson	Akampa, Nigeria	Ariwaodo and Olorunfemi	FHI 92560	3-2-76
	Zaria, Nigeria	A.O. Ohaeri	FHI 102258	31-1-77
	Yendi, Ghana	Adams and Akpabla	FHI 53569	3-12-50
	Ibadan, Nigeria	J. Lowe	UIH 20399	3-6-84
	Ibadan, Nigeria	Ayodele 016	UIH 22221	15-11-95
	Kumba, Cameroon	J. Smith	FHI 1714	18-7-36
	Mambilla, Nigeria	Ayodele	UIH 22228	21-9-97
	Gembu, Nigeria	T.K. Odewo	FHI 87864	23-8-77
10. <i>P. salicifolia</i> (Brouss ex. Willd.) Assenov. subsp. <i>salicifolia</i>	Mambilla, Nigeria	Ekwuno, P.O.	FHI 77271	26-11-75
	Victoria, Cameroon	G. Ogu	FHI 49547	17-8-59
	Ago Iwoye, Nigeria	Ayodele	UIH 22222	16-3-95
	Bunban, Sierra Leone	Lowe, J.	UIH 11944	17-2-70
	Badagry, Nigeria	Oyayomi and Osanyinlusi	FHI 78400	21-4-73
11. <i>P. salicifolia</i> (Brouss ex. Willd.) subsp. <i>mambillensis</i> Ayodele	Mambilla, Nigeria	Ayodele	UIH 22230	22-9-97
	Mambilla, Nigeria	Ekwuno, P.O.	FHI 77271	26-11-75
	Bamessi, Cameroon	Brunt, M	UIH 12241	27-3-62
	Suakoko, Liberia	Blickenstaff, M.L.	FHI 50869	16-3-52
	Bamenda, Cameroon	Tamajong	FHI 23456	18-8-47
12. <i>P. setosula</i> (A. Rich.) K.L. Wilson	Mambilla, Nigeria	Ayodele	UIH 22232	21-9-97
	Mambilla, Nigeria	Ayodele	UIH 22231	21-9-97
	Jangla, Cameroon	F.N. Hepper	FHI 54563	5-2-58
13. <i>P. glomerata</i> S. Ortiz and J.A.R. Paiva	Bauchi, Nigeria	H.V. Lely	FHI 1716	Sept., 1930
	Gembu, Nigeria	B.O. Daramola	FHI 86014	16-8-77
	Bamenda, Cameroon	R.H. Brown	UIH 1227	1-5-65
14. <i>Rumex abyssinicus</i> Jacq.	Kamatan, Nigeria	B.O. Daramola	FHI 62490	5-12-68
	Mambilla, Nigeria	T.K. Odewo	FHI 88065	16-8-77
	Nkambe, Cameroon	F.N. Hepper	FHI 53391	11-2-58
	Buea, Cameroon	Dundas	FHI 13936	27-4-46
	Bamenda, Cameroon	B.O. Daramola	FHI 40627	23-1-59
15. <i>Rumex bequaertii</i> De Willd.	Bamenda, Cameroon	J.S. Lightbody and R.W.J. Keay	FHI 28397	3-1-51
	Njala, Sierra Leone	J.K. Morton	FHI 5317	19-1-54
16. <i>Symmeria paniculata</i> Benth.	Dakar, Senegal	Nonganiema A.	FHI 17149	18-4-66
	Eket, C.R.S., Nigeria	Ayodele/Ariwaodo 004	–	20-4-96
17. <i>Afrobrunnichia erecta</i> Hutch. and Dalz.	Ivory Coast	W. deWilde, C.S.	FHI 26835	14-10-63
	Kumba, Cameroun	A. Binuyo and B.O. Daramola	FHI 35096	7-1-56
	Umudike, Nigeria	Aiwaodo	FHI 47853	15-10-64

(continued on next page)

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