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POSSIBILITIES



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SEPASAL is a database and enquiry service about useful "wild" and semi-domesticated plants of tropical and subtropical drylands, developed and maintained at the Royal Botanic Gardens, Kew. "Useful" includes plants which humans eat, use as medicine, feed to animals, make things from, use as fuel, and many other uses.

Since 2004, there has been a Namibian SEPASAL team, based at the National Botanical Research Institute of the Ministry of Agriculture which has been updating the information on Namibian species from Namibian and southern African literature and unpublished sources. By August 2007, over 700 Namibian species had been updated.

Work on updating species information, and adding new species to the database, is ongoing. It may be worth visiting the web site and querying the database to obtain the latest information for this species.

Internet SEPASAL

New query

Edit query

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 *Display help*In names list include: synonyms vernacular names and display: All names per page*Your query found 1 taxon***Echinochloa stagnina (Retz.)P.Beauv. [1605]**

Family: POACEAE

Synonyms

Echinochloa scabra (Lam.)Roem. & Schult.

Vernacular names

Afrikaans (Namibia)	Watergras [2259] [5083] [5115]
Afrikaans (South Africa)	Langnaaldwatergras [2259], watergras [2259]
English (Namibia)	burgu grass [2259] [5115]
English (South Africa)	long-awned water grass [2259]
English (Southern Africa)	water grass [2182], long-awned water grass [2182] [6586]
English (Zimbabwe)	hippo grass [2259] [6586], umvuma grass [2259], water grass [2259]
German (Namibia)	Sumpf-Igelhirse [2259] [5083] [5115]
Indian	banti [6586]
Sotho (South Africa)	Bohome-ba-liliba [2259], Joangnyana-ba-mehlaka [2259], Lehola-la-lipere [2259], Mabele-a-linonyana [2259], Motle-pere [2259]
Unknown (Mozambique)	nandratane [5480]
Unknown (West Africa)	Burgu (grass) [2259]
Unspecified language	koudou [6578]
West Africa	bourgou [6586], gamarawal [6586]

Distribution

Plant origin	Continent	Region	Botanical country
Native	Africa	East Tropical Africa	Kenya [2259], Tanzania [2255] [6573], Uganda [2255] [6573]
		Northeast Tropical Africa	Chad [2255], Ethiopia [2255], Somalia [2255], Sudan [2255]
		Northern Africa	Egypt [2255]
		South Tropical Africa	Angola [5126], Malawi [3]

			[2259], Mozambique [2259], Zambia [3] [2259] [5481], Zimbabwe [3] [2259] [5125]
		Southern Africa	Botswana [3] [5104] [5119] [5186], Cape Province [2259], Caprivi Strip [5115], Lesotho [2259] [5104] [5550], Namibia [2182] [2259] [5104] [5115], Natal [2259], Orange Free State [2182] [2259], Swaziland [2259] [5452], Transvaal [2259] [5104]
		West Tropical Africa	Burkina [2255], Ghana [2255], Guinea [2255], Mali [2255], Mauritania [2255], Niger [2255], Nigeria [2255], Senegal [2255], Sierra Leone [2255], The Gambia [2255]
		West-Central Tropical Africa	Burundi [2255], Cameroon [2255], Central African Republic [2255], Congo [2259], Gabon [2259], Rwanda [2255], Zaire [2259]
	Asia-Tropical	Western Indian Ocean Indian Subcontinent	Madagascar [5115] [6573] Assam [2255], Bangladesh [2255], Nepal [2255], Pakistan [2255], Tamil Nadu [2255], Uttar Pradesh [2255], West Bengal [2255]
		Indo-China	Burma [2255]
Status Unknown	Asia-Tropical	Indo-China Malesia	Vietnam [2255] Philippines [2255]

ISO countries: Australia [6586] , India [2255] , Papua New Guinea [6586] , South Africa [2182] [5104]

Descriptors

Category	Descriptors and states
DESCRIPTION	Herb [2255]; Prostrate/Procumbent/Semi-erect [2255]; Aquatic [2182] [5115] [5130] [6586]; Annual [3] [2182] [5104] [6573] [6586]; Erect [2255]; Terrestrial [2255]; Rhizomatous [2182] [2259] [6573]; Perennial [3] [2259] [5104] [5115] [6573] [6586]; Stoloniferous [2182]; Unarmed - unspecified parts [2255]; Plant Height 800-2000 m [2182] [2259] [5104]
SOILS	Sometimes Waterlogged (frequency unknown) [2259] [6573] [6590]; Saline [2255]; Poorly Drained [2182] [2259] [5130] [5608] [6578] [6586] [6590]; Strongly Alkaline [6586]; Seasonally Waterlogged [5608] [6578] [6586]; Clays [6586]
HABITAT	Grassland/Forb-Land [2182] [6586]; Wooded Grassland [2182]; Watercourses [3] [2182] [5608] [6573] [6590]; Lakes/Ponds/Pools [6586]; Vlei/Dambo/Seasonally Flooded Grassland

[2182] [2259]; Pans [3] [2182] [2259] [5115]; Altitude 1000-2110 m a.s.l. [3] [2255] [5104] [6573] [6586]

PRODUCTION AND VALUE

Used in Manufacturing Industry [6590]; Potential Fuel Uses [6578]

SOURCES OF PLANTING MATERIAL

RBG Kew Seed Bank

FURTHER DATA SOURCES

Botanical Illustration [2259]; Additional References [550]; Included in PROTABASE [5450]; Regional Distribution Map [2259]; Grid Map [2182] [5115]

SEPASAL DATASHEET STATUS

Nomenclature Checked

CHEMICAL ANALYSES

Unspecified Sugars - stems [6586]; Unspecified Sugars - leaves [6586]

CLIMATE

Annual Rainfall >= 250 mm [5106] [5115]

Uses

Major use

Use group

Specific uses

FOOD	Unspecified Aerial Parts	alcoholic beverages [2259]; pastry/shortening [6578]; confectionery [6578]
	Stems	sugar [5608] [6590]; sweet dishes [5608]; sugar, alcoholic beverages [5608]; sugar, non-alcoholic beverages [5608]; juices [6578]
	Seeds	famine food [1171] [2259] [2795]
FOOD ADDITIVES	Unspecified Aerial Parts	vinegar [2259]
	Exudates	sap, vinegar [6586]
ANIMAL FOOD	Aerial Parts	unspecified aerial parts, mammals, fodder, dry season [5608]; fodder [2259] [6586] [6590]; unspecified aerial parts, game mammals, grazing [2259]; unspecified aerial parts, cattle [5130]; unspecified aerial parts, mammals, forage, dry season [5608]; forage; grazing [6573]; leafy stems/branches, hay/straw [6586]; cattle, grazing, dry season [6586]; sheep, grazing, dry season [6586]; grazing, dry season [6586]
MATERIALS	Unspecified Materials	soap [6586] [6590]; leaves, caulking [6578]; leaves, soap [6578]; caulking [6590]
	Fibres	unspecified aerial parts, thatch, buildings [2259]; thatch [6586] [6590]; stems, matting [6578]; stems, thatch [6578]
	Tannins/Dyestuffs	unspecified aerial parts, dyes [2259]; dyes, blue [6586] [6590]; leaves, dyes, mordants, blue [6578]
	Other Materials/Chemicals	unspecified aerial parts, soap [2259]; unspecified aerial parts, caulking [2259] [6586]
FUELS	Petroleum Substitutes, Alcohols etc.	vehicle fuel [6578]
VERTEBRATE POISONS	Mammals	cattle, purgative [6586]
ENVIRONMENTAL USES	Unspecified Environmental Uses	saline soils [2255]
	Revegetators	

Picture

None recorded

Notes

NOMENCLATURE/TAXONOMY

Name derivation:

From Greek 'echinos', hedgehog, and 'chloa', grass, alluding to the bristly hairs on the spikelets in most species. Stagnina from Latin 'stagnum', pool or lake, referring to the preferred habitat [2259] .

DISTRIBUTION

Tropical Africa and Asia, in Sepik and western districts of Papua New Guinea, tropical Australia [6586] .

Angola:

Occurs in the Cunene and Huíla provinces [5126] .

Botswana:

Occurs in Ngamiland, Central and Chobe districts [5186] .

Worldwide:

Southern Africa and south tropical Africa, Madagascar, Assam to Indo-China [3] [2182] [5115] .

RARITY/CONSERVATION

A Captain M.A. de Bat estimated the area of bourgou of the bend of the Niger at 250,000 hectares. Much of that area is now under cultivated rice [6578] .

Echinochloa stagnina is the dominant grass in the central delta of the Niger and shores of Lake Chad which may occur in massive, nearly pure stands [6578] .

Central Africa:

At one time it covered an estimated 250 000 hectares of the central delta of the Niger. Much of the land is now under cultivated rice [5608] .

DESCRIPTION

Lifespan:

Rarely flowering in the first year and then appearing as an annual [6573] .

Usually growing in deep water, the culms rooted on the bottom and floating (lengths up to 10 m are reported) [6586] .

Inflorescence:

Open, 80-250 mm long, racemes 20-80 mm, branches clearly secund, spikelets narrowly ovate with rigid hairs on nerves; lower floret male or sterile; lower lemma with awns. Spikelets 4-6 mm long, 1.0-1.8 mm wide [2182] .

Leaves:

Leaf blade 100-450 mm long, 4-15 mm wide. Ligule a fringe of hairs, often absent in upper leaves [2182] .

Lifespan:

Its longevity in deep water and mud is uncertain, but in shallow water it is clearly annual [3] .

IDENTIFICATION

It differs from other Echinochloa species by having awns up to 20 mm long [5130] .

Southern Africa:

It is perennial, mostly 80-150 cm high, with an extensively creeping, sometimes floating rhizome. The culms are soft and compressible, tending to sprawl outwards from the base, often rooting from the lower nodes. The leaves are bright or dark green, the inflorescence light green, sometimes tinged with purple. The spikelets are either clustered, or they are scattered along the raceme axis. They are slightly rough and are conspicuously awned, the awns longer than the spikelets. The ligule is a fringe of rather stiff hairs. It is often absent from the upper leaves [2259] .

FOOD - UNSPECIFIED AERIAL PARTS

Alcoholic beverages:

It is used in the Niger area of west Africa to make a "beverage resembling cider" [2259] .

FOOD - STEMS

Juices:

The plant is dried in then sun, then the leaves are burnt off with a light flame, to keep only the stems. The stems are tied to large bundles which are carried by donkeys or humans. The stems are then washed and dried and reduced to powder as fine as possible. The powder is then put in a large earthen jar specially made with little holes in the bottom. Hot water is poured over it and it carries all the juice of the plant; which is very sugary; the water takes on a rather clear violet colour. The drink is highly esteemed by the natives who taste it with pleasure but it has the effect of a purgative for people not used to it and it almost retains a slight smoky flavour which makes it disagreeable to drink. The Mohamedans permit its use without question; the Moors also drink it but always mix it with sour milk [6578] .

Sugar:

In Central Africa the Fulani people got sugar from the plant. Some of the sugar produced by photosynthesis is not converted to starch and accumulates in the stems [5608] .

Sugar:

Canes are gathered in some parts for the extraction of sugar [6590] .

FOOD - SEEDS

In India, it is usually boiled and eaten like rice [6586] .

Central Africa:

The Fulani people harvested large amounts of bourgou seed for food [5608] .

Famine food:

In former times, wild grasses often served as famine food during drought [2795] .

Grains are eaten [6590] .

FOOD ADDITIVES - UNSPECIFIED AERIAL PARTS

Vinegar:

It is used in the Niger area of west Africa to extract a sugary sap for making vinegar "or a beverage resembling cider" [2259] .

FOOD ADDITIVES - EXUDATES

Sap, vinegar:

Used to extract a sugary sap for making vinegar [6586] .

ANIMAL FOOD

It was an enormously important resource for the Peul (Fulani), because, as the floodwaters receded, the fodder became available for their livestock. This was the best fodder of the year, and those tribes with cattle could fatten them in order to carry them through dry season when weight losses were often drastic. In early colonial times, mounted troops were headquartered at Segou because of the abundance of this grass [6578] .

ANIMAL FOOD - AERIAL PARTS

Cattle, grazing, dry season:

In the interior delta of the Niger it provides a most important source of green grazing for livestock during the dry season. The livestock graze the fodder as the waters recede under high evaporation, the cattle grazing first and then sheep as the waters become more shallow. The grass is similarly utilized where it occurs in moist areas in other semi-arid and arid countries [6586] .

Cattle, sheep, grazing:

In the dry season the pasture is grazed as the waters recede, cattle feeding in the deeper water followed later by sheep as the waters dry up [6586] .

Fodder:

In the Niger area of West Africa it yields excellent fodder [6586] .

Grazing, dry season:

It is mostly a dry-season reserve for animal grazing because the swamps dry out gradually at that time and livestock gain access [6586] .

Grazing, dry season:

Its quick growth and adaptability to clay depressions and lake shores in the dry Sahel for dry-season grazing [6586] .

Grazing:

Well grazed by stock [6573] .

Leafy stems, hay:

The long trailing leafy stems have a high sugar content. If dried they make coarse, though palatable, hay [6586] .

Palatability is excellent. The long trailing stems floating on water have a high sugar content. It is still palatable when dry [6586] .

Fodder:

In Africa this grass has a reputation as fodder because of its locally abundant supply and high sugar content [2259] .

Fodder:

In the Niger area of west Africa it yields excellent fodder [2259] .

Fodder:

Yields an excellent fodder [6590] .

Unspecified aerial parts, cattle:

A valuable feed for cattle, growing in water and around the Okavango Delta area (Botswana) associated with *Vossia cuspidata* [5130] .

Unspecified aerial parts, game mammals, grazing:

Food plant of warthog in Kafue and hippo [2259] .

Unspecified aerial parts, mammals, fodder, forage, dry season:

Today bourgou is mainly used for fodder. In Central Africa it is notably important at the beginning of the dry season. As the annual floodwaters recede, it provides the vital forage needed to fatten livestock before the dry season sets in and their drastic weight losses begin [5608] .

MATERIALS - UNSPECIFIED MATERIALS

Caulking, leaves:

The leaves of bourgou were used to caulk canoes [6578] .

Soap:

It is burnt to produce a 'salt' for making soap [6586] .

Caulking:

Yields material for caulking [6590] .

Soap:

Burned to produce salt used in the manufacture of soap [6590] .

MATERIALS - TANNINS/DYESTUFFS

Blue, dyes:

Used for making indigo [6586] .

Dyes, blue, mordant, leaves:

The leaves are burnt to ash and used as a mordant with indigo dye??? [6578] .

Dyes, unspecified aerial parts:

In the Niger area of west Africa it is burnt to produce a salt for making indigo [2259] .

Dyes, blue:

Burnt to produce salt used in the manufacture of indigo [6590] .

MATERIALS - OTHER MATERIALS/CHEMICALS

Caulking, unspecified aerial parts:

Used for caulking [6586] .

Caulking, unspecified aerial parts:

In the Niger area of west Africa it is used for caulking [2259] .

Unspecified aerial parts, soap:

In the Niger area of West Africa it is burnt to produce a salt for making soap [2259] .

FUELS - PETROLEUM SUBSTITUTES/ALCOHOLS ETC.

Vehicle fuel:

A company was looking into the possibility of using alcohol derived from it to fuel shipping on the middle of Niger [6578] .

VERTEBRATE POISONS - MAMMALS

Cattle, purgative:

In Zambia, scouring occurs when cattle move from the fibrous forest grazing to the rich plains grasses consisting of *Echinochloa scabra* , *E. pyramidalis*, *Acroceras macrum*, *Hemarthria altissima*, *Leersia hexandra* and *Vossia cuspidata*, and it may be 3 to 4 months before they regain condition [6586] .

NUTRITIONAL VALUE

Leaves, stems:

The long trailing leafy stems have a high sugar content [6586] .

WEED PROBLEMS CAUSED

In India it is grown as a crop and intercultivated and weeded. It competes well with weeds in swamps [6586] .

CLIMATE

Summer [6586] .

RAINFALL

It is aquatic, which presupposes plenty of available water [6586] .

ALTITUDE

0-2430 m a.s.l. [6573] .

1000-2000 m a.s.l. in Tanzania [6586] .

Southern Africa:

800-1700 m [5104] .

Southern tropical Africa:

600-1600 m [3] .

TOPOGRAPHY/SITES

Lake shores and swamps in water up to 3 m deep [6586] .

Swamps, streamsides in water [6573] .

Africa:

Found along riverbanks and other moist areas [5608] .

Namibia:

In water in shallow pans [5115] .

Southern Africa:

Growing in water or mud, streamsides, on the edges of pools, dams, road drains and often floating in water [2182] [2259] .

Found on the edges of streams and in swamps [6590] .

Southern tropical Africa:

Streamsides and pond margins, growing in water; sometimes floating in deep water, or collapsed in a tangle on mud

after recession of flood [3] .

DRAINAGE

Tolerates flooding well [6586] .

SOILS

It prefers clay soils of high lime content [6586] .

Zambia:

Found on laterite in northern Zambia [3] .

VEGETATION

Common admixtures are *E. pyramidalis*, *E. colona*, and *Oryza longistaminata* [6578] .

It is abundant on the shores of Lake Victoria in Ghana along with *Barchiaria mutica* [6586] .

Seasonally flooded grassland [6586] .

ENVIRONMENTAL FACTORS - MISCELLANEOUS

Africa:

Found along riverbanks and other moist areas especially those of Central Africa and on the central delta of the Niger [5608] .

Southern Africa:

Found around pans, swamps and other wet areas [2182] [2259] [5130] .

FLOWERING/FRUITING/SEED SET

Seedset, India:

It ripens in October [6586] .

Flowering, southern Africa:

December to May [2182] .

VEGETATIVE GROWTH

In India it is planted in June and July and is ready for harvest in October [6586] .

CYTOLOGY

$2n=36, 54, 108, 126$ [6586] .

For the genus $x = 9$ (high polypoidy) [5150] .

PHYSIOLOGICAL TOLERANCES

By reason of its adaptation to swamps it escapes the ravages of all but the most severe droughts in which the soil moisture disappears [6586] .

When the water recedes the stems root at the nodes and produce excellent regrowth for grazing during the dry season [6586] .

CULTIVATION

In India it is grown as a crop known as *banti*, on fully prepared land [6586] .

India:

Cultivated mainly by the poor [6586] .

PROPAGATION FROM SEED

India:

It is sown in June and July at 7 Kg/ha [6586] .

It is drilled in rows 30 cm apart and thinned later [6586] .

It is sown at about 1-1.5 cm deep and lightly covered [6586] .

PROPAGATION - VEGETATIVE

Cuttings:

Sown by cuttings in prepared soil [6586] .

HARVESTING

Grain is separated from the husk by pounding [6586] .

Grains are harvested when ripe and consumed as other cereals, but more importantly, *E. stagnina* is a sugar plant [6578] .

YIELDS

4000 Kg DM/ha in young growth, 13,000 Kg DM/ha at complete maturity, 150 Kg DM/ha in 30 days' regrowth after irrigation [6586] .

It does not produce much seed [6586] .

ACKNOWLEDGEMENTS AND DATASHEET PROGRESS

Updated for southern Africa by E. Irish; checked by A. Jarvis; Sepasal Namibia, National Botanical Research Institute, May 2005 .

MISCELLANEOUS NOTES

It is wholesome [6586] .

Of all the wild plants around Timbuctou, bourgou is undoubtedly of the greatest value to the people of the region [6578] .

References

- [3] Flora Zambesiaca. 1960-. London: Crown Agents for Overseas Governments and Administrations. En. Edited by A.W. Exell et al.
- [550] Burkill, H.M. 1994. *The useful plants of West Tropical Africa. Volume 2. Families E-I*. Kew, U.K.: Royal Botanic Gardens, Kew. xii, 636p. En. Supplement to Keay, R.W.J. and Hepper, F.N., eds. (1954-1972), *The Flora of West Tropical Africa*, 2nd ed.
- [1171] Fox, F.W. and Norwood Young, M.E. 1982. *Food from the veld. Edible wild plants of Southern Africa*. Johannesburg and Cape Town: Delta. 399p. En.
- [1605] Flora of Somalia. 1993-. Kew, U.K.: Royal Botanic Gardens. Edited by M. Thulin.
- [2182] Gibbs Russell, G.E., Watson, L., Koekemoer, M., Smook, L. et al. 1990. *Grasses of Southern Africa*. Pretoria, South Africa: National Botanic Gardens/Botanical Research Institute. 437p. Mem. Bot. Survey South Africa No. 58.
- [2255] SEPASAL.. *Survey of Economic Plants for Arid and Semi-Arid Lands. Notes from SEPASAL datasheet*. Kew, U.K.: Centre for Economic Botany, Royal Botanic Gardens, Kew.
- [2259] Chippindall, L.K.A. and Crook, A.O. 1976. *Grasses of Southern Africa*. Salisbury, Rhodesia: M.O. Collins. 240 parts in loose leaf form.
- [2514] Peters, C.R., O'Brien, E.M. and Drummond, R.B. 1992. *Edible wild plants of sub-Saharan Africa*. Kew, U.K.: Royal Botanic Gardens, Kew. 239p. En.
- [2795] Van Wyk, B.-E. and Gericke, N. 2000. *People's plants: a guide to useful plants of Southern Africa*. Pretoria, South Africa: Briza Publications. 351p. En.
- [5083] Craven, P. and Kolberg, H. In prep. *Common names of Namibian plants*. Windhoek.

- [5104] Germishuizen, G. and Meyer, N.L., eds. 2003. *Plants of southern Africa: an annotated checklist*. Strelitzia 14. Pretoria: National Botanical Institute.
- [5106] Mendelsohn, J., Jarvis, A., Roberts, C. and Robertson, T. 2002. *Atlas of Namibia. A portrait of the land and its people*. Cape Town, South Africa: David Philip.
- [5115] Klaassen, E.S. and Craven, P. 2003. *Checklist of grasses in Namibia. SABONET Report No. 20*. Pretoria and Windhoek: Southern African Botanical Diversity Network.
- [5119] Chippindall, L.K.A. 1946. *The common names of grasses in South Africa/Gewone name van grassoorte in Suid-Afrika. Bulletin No. 265*. Pretoria: Department of Agriculture. Department of Agriculture (Botany and Plant Pathology Series No. 7).
- [5125] Chapano, C. 2002. *A checklist of Zimbabwean grasses. SABONET Report No. 16*. Pretoria: Southern African Botanical Diversity Network.
- [5126] Costa, E., Martins, T. and Monteiro, F. 2004. *A checklist of Angola grasses - Checklist das Poaceae de Angola. SABONET Report No. 28*. Pretoria: Southern African Botanical Diversity Network.
- [5130] Field, D.I. 1976. *A handbook of common grasses in Botswana*. Gaborone: Ministry of Agriculture, Botswana.
- [5150] Leistner, O.A., ed. 2000. *Seed plants of southern Africa: families and genera. Strelitzia 10*. Pretoria: National Botanical Institute.
- [5186] Kabelo, M. and Mafokate, D. 2004. *A checklist of Botswana grasses. SABONET Report No. 24*. Gaborone and Pretoria: Southern African Botanical Diversity Network.
- [5450] PROTA (Plant Resources of Tropical Africa). 2002-. *Protabase*. Wageningen, The Netherlands: PROTA Foundation. Published on the internet; <http://database.prota.org/search.htm>.
- [5452] Braun, K.P., Dlamini, S.D.V., Mdladla, D.R., Methule, N.P. et al. 2004. *Swaziland flora checklist. SABONET Report No. 27*. Pretoria: Southern African Botanical Diversity Network.
- [5480] Da Silva, M.C., Izidine, S. and Amude, A.B. 2004. *A preliminary checklist of the vascular plants of Mozambique. SABONET Report No. 30*. Pretoria: Southern African Botanical Diversity Network. 183p.
- [5481] Phiri, P.S.M. 2005. *A checklist of Zambian vascular plants. SABONET Report No. 32*. Pretoria: Southern African Botanical Diversity Network. 167p.
- [5550] Kobisi, K. 2005. *Preliminary checklist of the plants of Lesotho. SABONET Report No. 34*. Pretoria and Roma: Southern African Botanical Diversity Network. 84p.
- [5608] National Research Council (U.S.) Board on Science and Technology for International Development. 1996. *Lost crops of Africa. Vol. 1. Grains*. Washington, D.C.: National Academy Press. xix, 383p. Also published on the Internet; <http://darwin.nap.edu/books/0309049903/html/R1.html>.
- [6573] Kamal, M. Ibrahim and Kabuye, H.S. Christine. 1987. *An illustrated manual of Kenyan grasses*. Food and Agriculture Organization of the United Nations. En.
- [6578] Harlan, J.R. 1989. *Wild-grass seed harvesting in the Sahara and sub-Saharan of Africa*. London, Univ Hyman. En.
- [6586] Sherman and Riveros. 1990. *Tropical Grasses*. FAO. En.
- [6590] Royal Botanic Gardens, Kew. 1927. *East African pasture plants, part 2 East African grasses*. The Crown Agents for the Colonies. En.

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