

Distribution and Some Morphological Characters of Wild Rice in Senegal

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Introduction

During the period from October to November in 1985, the writers have trip in Senegal for a collection of the wild and cultivated rices under the project, "Studies on the Distribution and Ecotypic Differentiation of Wild and Cultivated Rice Species in Africa", supported by a Grant from the Ministry of Education, Science and Culture of the Japanese Government. In this opportunity, wild rices in Senegal were studied.

On the distribution of wild rice in Senegal, some reports have already been published¹⁻⁶). Though Senegal has been considered to be one of the most important distribution areas of wild rice, accumulation of complete data on these aspect is far from being perfect. Taking these facts into account, the present study was made to accomplish the distribution and ecotypic differentiation of wild rice in Senegal. In the present paper, the habitat and the record of the morphological characters of unhusked grains of wild rice were described.

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Abstract of distribution and habitat of wild *Oryza* species

The localities concerned in this trip were southern and northern parts of Senegal. Geographical distributions of wild rice found were briefly illustrated in Figs. 1 and 2. In these figures, route of the trip and the growing areas of the wild rice are given.

Most of the seed samples collected were carried back to Japan and their plant and grain characters are now being analysed at Kagoshima University.

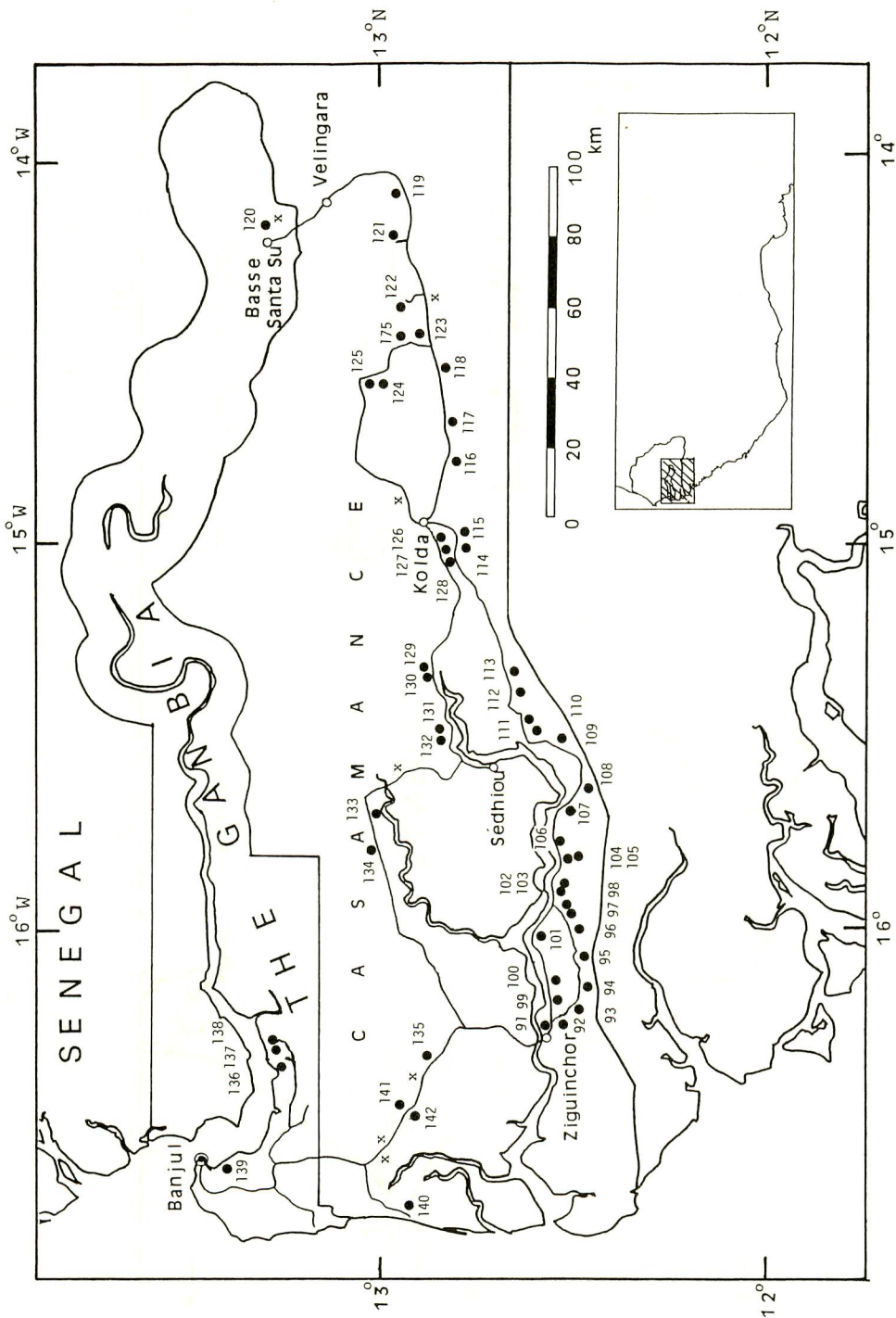


Fig. 1. Map showing several localities where the wild rice in Casamance region of Senegal were collected and observed. Solid line; route of observation, filled circle; collection area, cross mark; growing area where the samples were observed but not collected, open circle; main town. Code-numbers used in the figure are corresponding to the strain number used in the tables.

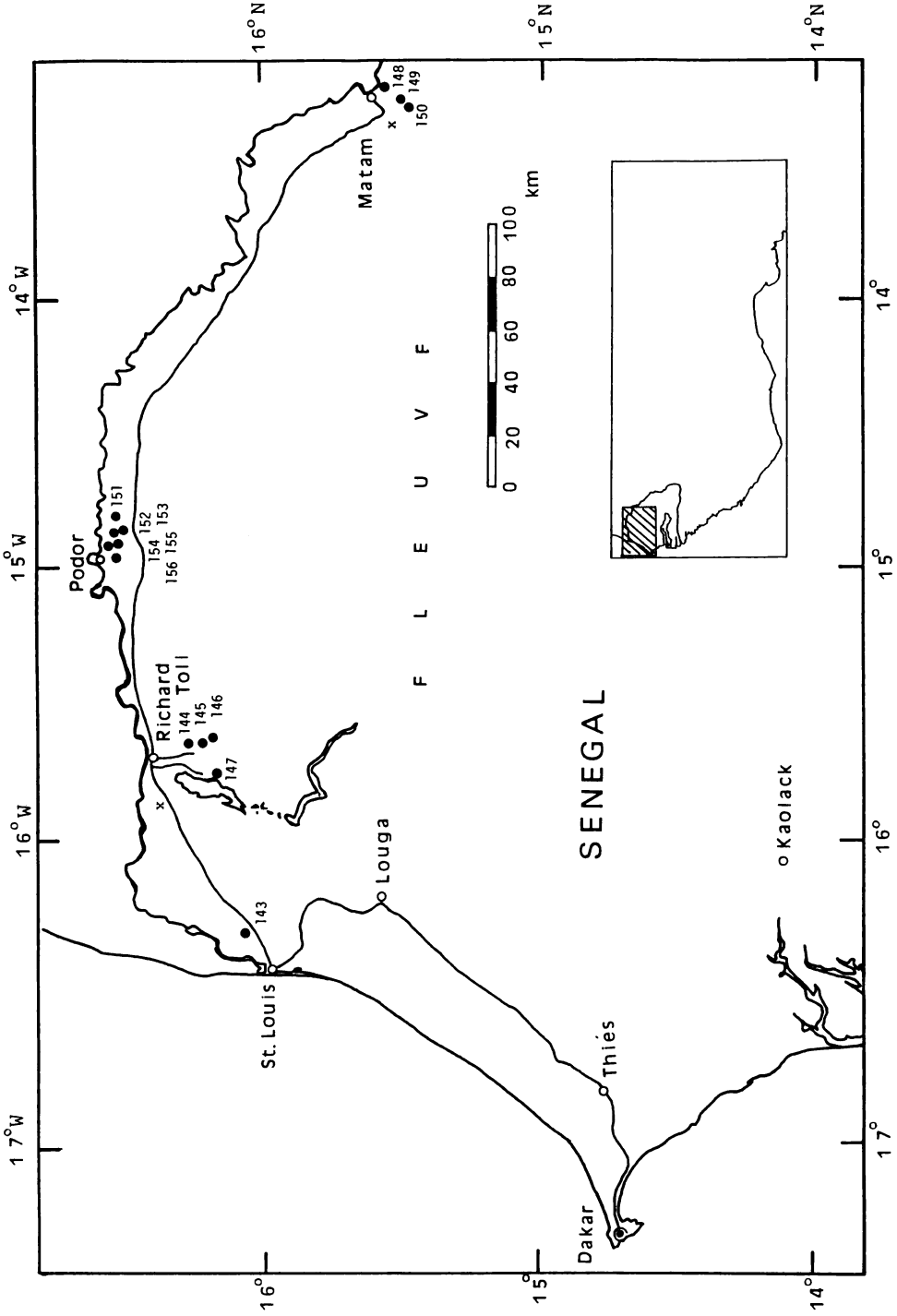


Fig. 2. Map showing several localities where the wild rice in northern region of Senegal were collected and observed. Solid line; route of observation, filled circle; collection area, cross mark; growing area where the samples were observed but not collected, open circle; main town. Code-numbers used in the figure are corresponding to the strain number used in the tables.

Oryza longistaminata CHEV. et ROEHR.

Populations of the species were found in several districts, *i.e.*, Ziguinchor, Simbandi, Tanaff, Kolda, Saresara, Tiapa, Dabo, Anambe, Sefa, Bounkiling, Tangouri, Bignona, Kafoutine, Dioloulou, Richard Toll, lac du Guiers, Matam, N'Dioum, Nianga; *GAMBIA*; Bassè, Faraba Banta, Kafuta, Brikama.

They were found in road-side ditch, paddy field, grass land, swamp, pond, pool, forest, river-side, waste land, irrigation canal, dike, upland field.

Oryza breviligulata CHEV. et ROEHR.

Populations of the species were found in several districts, *i.e.*, Ziguinchor, Goudomp, Simbandi, Tanaff, Kolda, Tiapa, Biaobe, Anambe, Sefa, Dioloulou, St. Louis, Richard Toll, Matam, Nianga; *GAMBIA*; Kafuta.

They were found in paddy field, swamp, pond, upland field.

Oryza brachyantha CHEV. et ROEHR.

Population of the species was found only in shallow pond near Anambe. The habitat was surrounded by grass land, forest. It shows dia. 50 m area.

Distribution of wild rices collected and only observed were listed up in Table 1. In this table, collection number, species name, date of collection and observation, detailed localities and some informations of habitat were described.

Table 1. Distribution and habitat of the wild rice collected and observed in Senegal, 1985. Abbreviations: **L**; *Oryza longistaminata* CHEV. et ROEHR., **B**; *Oryza breviligulata* CHEV. et ROEHR., **R**; *Oryza brachyantha* CHEV. et ROEHR., **H**; natural hybrid, **-**; only observed and no collection, **m**; meter or meters, **km**; kilometer or kilometers, **N**, **E**, **S**, **W**; north, east, south and west sides of main road, respectively

Col- lected No.	Spe- cies	Date	Place	Detailed locality, habitat and remarks
W91	L	Oct. 30	Ziguinchor	N 2 km east from Ziguinchor. Paddy field of <i>O. sativa</i> , neighbouring building in east side. Road-side ditch. Growing thickly in edge of both areas.
W92	L	Oct. 30	Ziguinchor	N, S 11 km east from Ziguinchor. Paddy field, partially damaged by salt. Growing sporadically in the field (N), in edge and on an embankment (S).
W93	L	Oct. 30	Ziguinchor	S 18 km east from Ziguinchor. Guidel Village. Grass land, 1 km inside of the road, neighbouring palm yard. Growing thickly in only 2 plots in the central areas. Relatively low level.
W94	L	Oct. 30	Ziguinchor	S 24 km east from Ziguinchor. Rainfed paddy field of <i>O. sativa</i> , inside of the road. Growing in edge. Growing in 3 plots, 1 plant each, near an embankment. Relatively deep water. Cultivating <i>O. glaberrima</i> in east side.
W95	L	Oct. 30	Ziguinchor	S 29 km east from Ziguinchor. Boutaupa Village. Paddy field. Growing sporadically in edge.
W96	L	Oct. 30	Ziguinchor	S 37 km east from Ziguinchor. Large swampy area, inside of road. Growing in edge of the circle dia. 50 m, and in the whole areas of deep pool, dia. 4 m, located in the swampy area. Very muddy and grey colored soil.
W97	L	Oct. 30	Ziguinchor	S 33 km east from Ziguinchor. Paddy fields of <i>O. sativa</i> and <i>O. glaberrima</i> , separated by grass land from road. Growing in central and west side re-

- gions, near *O. glaberrima*.
- W98** **B** Oct. 30 Ziguinchor S 33 km east from Ziguinchor. Paddy fields of *O. sativa* and *O. glaberrima*, separated by grass land from road. Growing in central region, neighbouring with *O. glaberrima*. Allopatrically with **W97**, *O. longistaminata*.
- **L** Oct. 30 Ziguinchor S 30 km east from Ziguinchor and just entrance of Baghagha. Pond, 100 m × 200 m, clear water. Growing sporadically in the whole area. Peoples swimming here.
- **L** Oct. 31 Ziguinchor N 5 km east from Ziguinchor. Paddy field of *O. sativa*. Growing in edge.
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- **L** Oct. 31 Ziguinchor S 11 km east from Ziguinchor. Swampy area, cultivating *O. sativa* and mango trees. Growing in edge.
- W99** **L** Oct. 31 Ziguinchor S 12 km east from Ziguinchor. Small pool, 1 m × 10 m. Growing thickly. Surrounded by *Miscanthus* sp. Inside 200 m from road. Mangrove trees in 100 m south side. pH=5.
- **L** Oct. 31 Ziguinchor S 13 km east from Ziguinchor. Paddy field of *O. sativa*. Growing in edge. Niaaguis Village.
- W100** **L** Oct. 31 Ziguinchor S 16 km east from Ziguinchor. Large swamp, 200 m × 500 m, gourd-shaped, cultivating *O. sativa*. Growing in central region of west one, and in edge of east one.
- **B** Oct. 31 Ziguinchor S 16 km east from Ziguinchor. Large swamp, 200 m × 500 m, gourd-shaped, cultivating *O. sativa*. Growing in central area of east one.
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- **L** Oct. 31 Ziguinchor S 17 km east from Ziguinchor. Swamp, 100 m × 100 m. Growing thickly in the whole area.
- **L,B,H** Oct. 31 Ziguinchor S 21 km east from Ziguinchor. Large paddy fields of *O. sativa* and *O. glaberrima*, connected many plots, having ponds in several portions. Growing natural hybrids between *O. glaberrima* and *O. breviligulata*, mixed with *O. glaberrima* and *O. breviligulata*, 2 kinds of wild species growing thickly in some plots and sporadically in other plot.
- W101** **L** Oct. 31 Ziguinchor N, S 31 km east from Ziguinchor. Grass land, neighbouring paddy field in south side and swimming pond in east side (S). Grass land, embankment of paddy field of *O. sativa* and around of baobab trees (N). Growing sporadically in respective plots.
- W102** **L** Oct. 31 Ziguinchor N, S 41 km east from Ziguinchor. Paddy field of *O. sativa*. Growing on an embankment (S). Paddy field of *O. sativa*. Growing a few plants in edge. Dried-up paddy field and grass land. Growing in central regions (N).
- W103** **B** Oct. 31 Ziguinchor N 41 km east from Ziguinchor. Paddy field of *O. sativa*. Growing a few plants in edge.
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- **L** Oct. 31 Ziguinchor N 54 km east from Ziguinchor. Swamp, having pond in central region. Growing a few plants along road.
- W104** **B** Oct. 31 Ziguinchor N 54 km east from Ziguinchor. Swamp, having pond in central region. Growing around the pond. Paddy field of *O. sativa* and *O. glaberrima* in north and east sides, palm field in west side.
- **B** Oct. 31 Ziguinchor N 55 km east from Ziguinchor. Paddy field of *O. sativa*. Growing 1 plant only.
- **L, B** Nov. 1 Goudomp N 6 km east from Goudomp. Paddy field, partially maturing, after-harvesting. Growing sporadically in north and east sides.
- W105** **B** Nov. 1 Goudomp N 6 km east from Goudomp. Paddy field, partially maturing, after-harvesting. Growing in central region, boundary of maturing and harvesting plots. Threshing by foot. Separated by grass land from road about 200 m.
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- W106** **L** Nov. 1 Simbandi S 1 km west from Simbandi. Paddy field of *O. sativa* and *O. glaberrima*, 20 cm water depth. Growing in edge of the field and on an embankment. Neighbouring palm yard in north and west sides, and waste land owing to salt damage in east side.
- **L** Nov. 1 Simbandi N 14 km east from Simbandi. Paddy fields of *O. glaberrima* and river. Growing sporadically in respective plots.
- W107** **L** Nov. 1 Simbandi S 19 km east from Simbandi. Paddy field and joint of

- old and new roads. Growing sporadically in edge.
- W108** L Nov. 1 Tanaff N 29 km west from Tanaff. Paddy field of *O. sativa*. Growing sporadically near an embankment and nursery bed. Neighbouring forest in east side.
- W109** L Nov. 1 Tanaff N 17 km west from Tanaff. Paddy field in relatively high level and pond. Allopatrically with *O. breviligulata*.
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- B Nov. 1 Tanaff N, S 17 km west from Tanaff. Paddy field of *O. sativa* (*N*) and of *O. glaberrima* (*S*). Growing thickly in north and a few plants in south plots.
- L Nov. 1 Tanaff N, S 12 km west from Tanaff. Ponds, dia. 100 m (*N*) and dia. 200 m (*S*). Growing sporadically in edge.
- L Nov. 1 Tanaff N 3 km west from Tanaff. Swamp, space between palm fields. Growing a few plants in edge.
- W110** B Nov. 1 Tanaff N 3 km west from Tanaff. Swamp, space between palm fields. Growing only 3 plants in edge. Allopatrically with *O. longistaminata* mentioned above.
- W111** L Nov. 1 Tanaff S 4 km east from Tanaff. Pond, dia. 100 m, touched by an arch bridge in north side. Growing a few plants in eastern edge.
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- W112** L Nov. 1 Tanaff N 7 km east from Tanaff. Paddy fields of *O. sativa* and *O. glaberrima*. Growing sporadically in southwest edge, allopatrically with *O. breviligulata*, **W113**.
- W113** B Nov. 1 Tanaff N 7 km east from Tanaff. Paddy fields of *O. sativa* and *O. glaberrima*. Growing a few plants in southwest edge, allopatrically with *O. longistaminata*, **W112**.
- W114** L Nov. 1 Kolda S 8 km west from Kolda. Paddy fields of *O. sativa* and *O. glaberrima*. Growing a few plants in northeast edge, allopatrically with *O. breviligulata*, **W115**.
- W115** B Nov. 1 Kolda S 8 km west from Kolda. Paddy fields of *O. sativa* and *O. glaberrima*. Growing a few plants in northeast edge, allopatrically with *O. longistaminata*, **W114**. Pond, 100 m × 200 m, neighbouring paddy field mentioned above in west side, by another paddy fields in south and west sides, partially upland fields in northeast side.
- L Nov. 2 Saresara S 2 km west from Saresara. Paddy field of *O. sativa*. Growing in edge.
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- W116** L Nov. 2 Saresara S Saresara Village, 300 m inside from road. Swamp, 200 m × 200 m, surrounded by paddy field of *O. sativa*, and upland field of *O. sativa* in further southwest side. Growing thickly in edge.
- B Nov. 2 Bagadadji S 5 km east from Bagadadji. Paddy field of *O. sativa*, 100 m × 300 m, deep water type. Growing 4 plants in north edge. Separated by road from another paddy field, *O. sativa*, shallow water type.
- W117** B Nov. 2 Tiapa S 6 km east from Tiapa. Paddy field of *O. glaberrima*, 30 cm water depth. Growing a few plants in north edge. Surrounded by palm yards in 3 sides.
- W118** B Nov. 2 Tiapa S 28 km east from Tiapa. Swamp, dia. 200 m. Growing thickly around the pond in central region. No plant in central region.
- L Nov. 2 Tiapa N, S 30 km east from Tiapa. Swamp, dia. 200 m. Growing sporadically but whole around the pond in central region.
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- W119** L Nov. 2 Tiapa N 54 km east from Tiapa. Forest. Growing sporadically under shade by tall trees. *Hygroryza* sp. growing there. Neighbouring large pond in west side.
- W120** L Nov. 3 Bassè S In Bassè Town, GAMBIA. Pond, dia. 50 m, adjacent to Gambia River with 100 m width road. Growing thickly in east edge.
- L Nov. 3 Bassè S In Bassè Town, GAMBIA. Just south region of pond living of **W120**. Paddy field, grass land. Growing sporadically in edge and an embankment.
- W121** B Nov. 3 Biaobe E, W 4 km north from crossroad to Anambe; 41 km southwest from Velingara. Paddy field of *O. sativa*, surrounded by palm field and grass land. Growing sporadically.
- W122** B Nov. 3 Biaobe N 3 km northwest from the locality of **W121**. Paddy field, neighbouring road and irrigation canal, developed by government. Growing sporadically in edge.
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- W123** L Nov. 3 Dabo E, W 1 km north from Dabo. Stream, half-dried up, 3

- m width. Growing sporadically in edge.
- W175** R Nov. 3 Anambe E 2 km south from Anambe. Shallow pond, dia. 50 m, surrounded by grass land, maybe seasonal pond in sometimes, and heavy forest for outer portion in north, east and south sides, by bush road in west side, respectively. Growing thickly in northwest side of the pond. *O. breviligulata* growing in opposite side.
- B Nov. 3 Anambe E 2 km south from Anambe. Shallow pond, dia. 50 m, surrounded by grass land and heavy forest. Growing sporadically in southeast side, opposite side of *O. brachyantha*, **W175**.
- W124** L Nov. 3 Anambe N, S 20 km north from Anambe. Paddy field of *O. sativa* and *O. glaberrima*, surrounded by upland field in relatively high level. Growing sporadically in edge (N) and in central portion (S).
- W125** B Nov. 3 Anambe S 20 km north from Anambe. Paddy fields of *O. sativa* and *O. glaberrima*, surrounded by upland field in relatively high level. Growing sporadically in central portion, neighbouring **W124**, *O. longistaminata*.
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- L,B Nov. 3 Kolda N 2 km east from entrance of Kolda. Paddy field. Growing sporadically in edge.
- L Nov. 4 Kolda S 6 km west from Kolda. Road-side ditch. Growing sporadically.
- W126** L Nov. 4 Kolda S 29 km west from Kolda. Rainfed paddy field, separated by irrigated paddy field, 100 m width, from road. Surrounded by another rainfed paddy field in west side, waste land and forest in south and east sides. Growing sporadically in the whole areas.
- W127** L Nov. 4 Kolda S 44 km west from Kolda. Paddy field of *O. sativa*, having lotus pond in the central region. Connected with another paddy field, space between road and bridge. Growing a few plants in northwest edge.
- W128** B Nov. 4 Kolda S 44 km west from Kolda. Paddy field of *O. sativa*, having lotus pond in the central region. Growing sporadically between pond and *O. sativa* and separated from *O. longistaminata*, **W127**.
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- W129** L Nov. 4 Kolda N 50 km west from Kolda. Paddy field of *O. sativa*, having dried-up pond in northern portion. Growing sporadically in south edge, sympatrically with *O. breviligulata*, **W130**.
- W130** B Nov. 4 Kolda N 50 km west from Kolda. Paddy field of *O. sativa*, having dried-up pond in northern portion. Growing sporadically in southern edge, sympatrically with *O. longistaminata*, **W129**.
- W131** L Nov. 4 Sefa N 11 km east from Sefa. Paddy field of *O. sativa*, connected with waste land in west side. Growing sporadically in eastern edge.
- W132** B Nov. 4 Sefa N 11 km east from Sefa. Boundary of paddy field, growing *O. longistaminata*, **W131**, and waste land. Connected with pond and salt damaged waste land in western side. Growing a few plants.
- L,B Nov. 4 Bounkiling E 8 km south from Bounkiling. Damaged paddy field owing to salt and re-cultivating paddy field owing to washed by heavy rain. pH=5.3. Growing on an embankment. Just south of Bungrougrou River.
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- W133** L Nov. 4 Bounkiling S 24 km west from Bounkiling. Paddy field of *O. sativa*. Growing a few plants in edge, 10 cm water depth.
- B Nov. 4 Bounkiling S 24 km west from Bounkiling. Paddy field of *O. sativa*. Growing a few plants in middle portion, 30 cm water depth.
- L Nov. 4 Diacounda N 6 km west from Diacounda. Paddy field. Growing sporadically.
- W134** L Nov. 4 Tangouri N 20 km east from Tangouri. Paddy field of *O. sativa*. Growing sporadically in boundary of two fields, indistinct canal, embankment, 30 cm water depth.
- W135** L Nov. 5 Bignona N 22 km northwest from Bignona. Paddy field of *O. sativa*. Growing in boundary of 2 fields, separated by unclear embankment. Conspicuous high ridge cultivation preventing salt damage.
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- L Nov. 5 Diouloulou N 18 km southeast from Diouloulou. Paddy field. Growing in edge.

- L Nov. 5 Dioloulou N 14 km southeast from Dioloulou. Paddy field. Growing sporadically in edge.
- L Nov. 5 Dioloulou N 4 km southeast from Dioloulou. Road-side ditch. Growing sporadically.
- L Nov. 5 Dioloulou S 2 km southwest from Dioloulou. Road-side ditch. Growing a few plants.
- W136** L Nov. 6 Faraba Banta N 1 km north from Faraba Banta, GAMBIA. Paddy field of *O. sativa*. Growing sporadically on an embankment.
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- W137** L Nov. 6 Kafuta N 2 km north from Kafuta, GAMBIA. Near Gambia River in north side. Paddy field of *O. sativa*. Growing sporadically on embankment of respective fields.
- W138** B Nov. 6 Kafuta N 2 km north from Kafuta, GAMBIA. Near Gambia River in north side. Paddy field of *O. sativa*. Growing sporadically in the field, allopatrically with *O. longistaminata*, **W137**.
- W139** L Nov. 6 Brikama, GAMBIA W 17 km north from Brikama. Swamp, space between new and old roads, just south of office of conservation of nature. Growing sporadically in west, old road side. Paddy field and upland field, sweet potatoes, opposing in east side of main road.
- W140** L Nov. 7 Kafoutine E Near Kafoutine Village. Paddy field, having pond, lotus swamp, work room. Growing sporadically along swamp, thickly, 10 m × 5 m, in edge of paddy field. Waste land between large and small road. Growing sporadically in central swampy area.
- W141** L Nov. 7 Dioloulou N, S 9 km east from Dioloulou. Paddy field of *O. sativa*. Growing a few plants in edge (N). Waste land and road-side ditch. Growing sporadically in the whole areas (S).
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- W142** B Nov. 7 Dioloulou S 9 km east from Dioloulou. Pond, 30 m × 40 m, separated about 50 m by waste land, growing *O. longistaminata*, a part of **W141**, from main road. Growing sporadically in east and west sides.
- B Nov. 8 Charli N 1 km west from Charli. Swamp. Growing sporadically in edge.
- L Nov. 8 St. Louis N 7 km northeast from St. Louis. Recently established paddy fields. Growing sporadically in edge.
- W143** B Nov. 8 St. Louis N, S 21 km northeast from St. Louis. Paddy field, established 10 years ago. Growing in edge of paddy fields and road-side pool.
- L Nov. 8 St. Louis N, S 21 km northeast from St. Louis. Paddy field, established 10 years ago. Growing in edge of paddy fields and road-side ditch.
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- W144** L Nov. 10 Richard Toll N 22 km south of ISRA office in Richard Toll. Colonat Village, 300 m east inside from main irrigation canal. Paddy fields, sub-irrigation canal, waste land. Growing sporadically in some place and thickly in other place in edge of paddy field and canal.
- W145** B Nov. 10 Richard Toll E, N, S 22 km south of ISRA office in Richard Toll. Colonat Village and suburbs. Paddy fields. Growing thickly in Colonat Village and sporadically along the road.
- L Nov. 10 Richard Toll E 20 km south of ISRA office in Richard Toll. Paddy fields. Growing sporadically in edge and small canal.
- W146** B Nov. 10 Richard Toll E 19 km south of ISRA office in Richard Toll. Paddy field and swamp. Growing thickly along the third irrigation canal and paddy field and swamp.
- L Nov. 10 Richard Toll E 17 km south of ISRA office in Richard Toll. Paddy field. Growing thickly in edge.
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- W147** L Nov. 10 lac de Guiers W 32 km south from Richard Toll. Upland field, cultivating tomato, okra. Swamp, dike and lac Guiers. Growing shore of lac, waste lands between dike and sub-irrigation canal, on embankment of upland fields.
- W148** B Nov. 11 Matam N 3 km southeast from Matam. Over a branch of Senegal River. MAURITANIA on the other side of the river. Dried-up upland fields, after harvested upland rice, sorghum. Growing sporadically in edge and on an embankment.
- W149** L Nov. 11 Matam N 19 km southeast from crossroad of Ourosogui. Inside

of Juc Village. Upland rice field. Growing a few plants, sympatrically with *O. breviligulata*, **W150**.

W150	B	Nov. 11	Matam	<i>N</i> 19 km southeast from crossroad of Ourosogui. Inside of Juc Village. Upland rice field, cowpea, sorghum and other upland crops. Growing a few places along fence of entrance, thickly along barbwire fence, in upland rice field, partially sympatrically with <i>O. longistaminata</i> , W149 .
-	L	Nov. 11	Matam	<i>N</i> 20 km southeast from crossroad of Ourosogui. Djanajolu Village. Swamp. Growing sporadically in edge.

W151	L	Nov. 11	N'Dioum	<i>N</i> 2 km inside of main road, 12 km west from N'Dioum. Irrigation canal between paddy field of <i>O. sativa</i> and road. Growing thickly in the whole areas.
-	B	Nov. 11	Nianga	<i>N</i> 6 km southeast from office of Project, RELAIS, Périmètre Vailee Nianga. Growing in edge of paddy field.
W152	L	Nov. 12	Nianga	<i>N, S</i> In Project Field of Nianga. Paddy fields of <i>O. sativa</i> and <i>O. glaberrima</i> , irrigation canal. Growing sporadically in edge of paddy field and thickly in canal.
W153	B	Nov. 12	Nianga	<i>S</i> In Project Field of Nianga. Paddy fields of <i>O. sativa</i> and <i>O. glaberrima</i> and secondary irrigation canal. Growing sporadically in the central region of paddy field and in edge of canal.
W154	L	Nov. 12	Nianga	<i>N, S</i> In Project Field of Nianga. Lotus pond, waste land, dike and third irrigation canal. Growing sporadically in edge of pond, central region of waste land, the whole areas in dike and canal.

-	L	Nov. 12	Nianga	<i>N, S</i> In Project Field of Nianga. River. Growing sporadically in edge.
W155	L	Nov. 12	Nianga	<i>E</i> In Project Field of Nianga. Lotus pond, paddy field. Growing sporadically in some place and thickly in other place in the respective fields.
W156	B	Nov. 12	Nianga	<i>E</i> In Project Field of Nianga. Paddy field. Growing sporadically in edge but inside of site of <i>O. longistaminata</i> , W155 .
-	L	Nov. 12	Richard Toll	<i>S</i> 2 km west from Richard Toll. Paddy field. Growing sporadically.
-	L	Nov. 12	Richard Toll	<i>S</i> 11 km west from Richard Toll. Paddy field. Growing sporadically.

-	L	Nov. 12	Richard Toll	<i>S</i> 15 km west from Richard Toll. Road-side ditch. Growing thickly.
-	L	Nov. 12	Ross-Béthio	<i>S</i> 23 km southwest from Ross-Béthio. Road-side ditch. Growing a few plants.

Some morphological characters of unhusked grains

Fourty-two strains of *O. longistaminata*, 24 strains of *O. breviligulata* and 1 strain of *O. brachyantha* were collected on this trip, and they were used for morphological investigations of unhusked grains. However, 1 strain of *O. longistaminata* was wholly immature and inadequate to be used for the measurement. Five to 30 grains were used for the measurement of each strain. Measurements were done in length, width and thickness of grain, and done at the most eminent section of the respective characters. Calculations were done for the ratios of length to width, of length to thickness, and of width to thickness. The whole data referring to the six characters were illustrated by the average values in the whole grains.

The whole strains of *O. longistaminata* and *O. breviligulata* were divided into two groups, *i.e.*, Group A --- strains collected in southern part of Senegal (Casamance),

Group B --- strains collected in northern part of Senegal (Matam), in aims of future analyses.

I. *Oryza longistaminata*

1. Lengths

Group A: The results are given in Table 2. Lengths for the individual grain level ranged from 9.45 mm (strain Nos.91, 100, 109 and 114) to 6.90 mm (No.126). In the

Table 2. Six morphological characters of unhusked grains; *O. longistaminata*

Strain No.	Length (mm)	Width (mm)	Thickness (mm)	L/W	L/T	W/T
91	8.92±0.50	2.42±0.13	1.62±0.09	3.69±0.26	5.51±0.17	1.50±0.08
92	9.08±0.21	2.45±0.06	1.69±0.08	3.71±0.15	5.38±0.26	1.45±0.07
93	9.09±0.10	2.23±0.11	1.69±0.09	4.09±0.20	5.39±0.28	1.33±0.13
94	7.93±0.32	2.45±0.10	1.62±0.02	3.24±0.14	4.90±0.19	1.51±0.07
95	8.48±0.42	2.42±0.12	1.51±0.09	3.52±0.32	5.63±0.42	1.61±0.14
96	8.90±0.23	2.35±0.05	1.51±0.02	3.79±0.05	5.90±0.21	1.56±0.04
97	8.43±0.22	2.26±0.08	1.57±0.05	3.73±0.15	5.37±0.13	1.44±0.06
99	8.01±0.17	2.62±0.08	1.69±0.02	3.06±0.06	4.74±0.15	1.55±0.66
100	8.87±0.35	2.49±0.02	1.66±0.04	3.56±0.13	5.34±0.13	1.50±0.03
101	-	-	-	-	-	-
102	8.53±0.06	2.42±0.08	1.66±0.07	3.53±0.14	5.15±0.21	1.46±0.11
106	8.35±0.25	2.50±0.14	1.68±0.06	3.35±0.17	4.98±0.29	1.49±0.10
107	8.75±0.21	2.54±0.07	1.63±0.05	3.45±0.08	5.37±0.22	1.56±0.05
108	8.77±0.31	2.33±0.12	1.57±0.07	3.77±0.12	5.59±0.14	1.48±0.05
109	9.21±0.24	2.42±0.08	1.62±0.05	3.81±0.09	5.69±0.27	1.50±0.06
111	8.94±0.13	2.35±0.10	1.61±0.04	3.81±0.15	5.56±0.12	1.46±0.05
112	8.85±0.38	2.14±0.06	1.53±0.02	4.14±0.25	5.79±0.26	1.40±0.04
114	9.25±0.15	2.66±0.07	1.72±0.04	3.48±0.13	5.38±0.08	1.55±0.05
116	8.44±0.25	2.52±0.14	1.26±0.15	3.36±0.26	6.77±0.65	2.04±0.30
119	8.64±0.33	2.43±0.04	1.60±0.06	3.56±0.09	5.41±0.31	1.52±0.07
120	8.77±0.20	2.29±0.10	1.54±0.04	3.84±0.23	5.70±0.24	1.49±0.05
123	8.66±0.11	2.43±0.07	1.67±0.07	3.57±0.10	5.19±0.18	1.46±0.03
124	8.78±0.13	2.45±0.05	1.65±0.13	3.58±0.05	5.36±0.47	1.49±0.11
126	7.97±0.76	2.22±0.05	1.40±0.12	3.59±0.27	5.77±0.96	1.60±0.17
127	9.08±0.25	2.69±0.10	1.80±0.00	3.38±0.07	5.04±0.14	1.49±0.06
129	8.98±0.18	2.78±0.08	1.81±0.02	3.23±0.05	4.96±0.14	1.54±0.06
131	8.67±0.30	2.38±0.11	1.65±0.06	3.65±0.21	5.26±0.18	1.44±0.06
133	8.61±0.17	2.43±0.15	1.54±0.07	3.55±0.17	5.61±0.32	1.58±0.15
134	8.53±0.17	2.31±0.09	1.61±0.07	3.70±0.16	5.31±0.33	1.44±0.06
135	8.67±0.31	2.22±0.19	1.58±0.04	3.94±0.39	5.49±0.26	1.41±0.14
136	8.52±0.21	2.28±0.16	1.51±0.06	3.75±0.25	5.65±0.24	1.51±0.05
137	8.42±0.15	2.31±0.07	1.61±0.13	3.65±0.08	5.26±0.40	1.44±0.08
139	8.47±0.33	2.42±0.07	1.51±0.07	3.50±0.12	5.63±0.45	1.61±0.11
140	9.18±0.09	2.02±0.06	1.62±0.05	4.56±0.11	5.68±0.14	1.25±0.05
141	8.32±0.19	2.40±0.13	1.51±0.04	3.48±0.26	5.51±0.19	1.59±0.09
144	9.16±0.32	2.46±0.11	1.61±0.05	3.73±0.20	5.70±0.31	1.53±0.06
147	8.62±0.61	2.31±0.15	1.52±0.02	3.76±0.47	5.68±0.33	1.52±0.12
149	10.52±0.13	2.83±0.07	1.80±0.03	3.72±0.05	5.85±0.11	1.57±0.04
151	8.49±0.67	2.38±0.09	1.61±0.04	3.57±0.29	5.28±0.45	1.48±0.07
152	9.19±0.15	2.75±0.03	1.81±0.02	3.34±0.04	5.08±0.07	1.52±0.01
154	9.15±0.20	2.56±0.16	1.79±0.06	3.59±0.25	5.12±0.13	1.43±0.07
155	8.97±0.22	2.68±0.04	1.72±0.08	3.35±0.05	5.23±0.36	1.56±0.09

strain level, the longest (9.25 mm) was obtained in No.114, followed by No.109 (9.21 mm) and No.140 (9.18 mm). The shortest (7.93 mm) was noted in No.94, followed by No.126 (7.97 mm) and No.99 (8.01 mm). Average and its standard deviations through the whole strains were found to be 8.68 ± 0.34 . In the standard deviations of each strain, the largest (0.76) was obtained in No.126, followed by No.91 (0.50) and No.95 (0.42). The smallest (0.06) was noted in No.102, followed by No.140 (0.09) and No.93 (0.10). Average and its standard deviations in the whole strains were found to be 0.25 ± 0.13 .

Group B: Lengths for the individual grain level ranged from 10.70 mm (No.149) to 7.90 mm (No.151). In the strain level, the longest (10.52 mm) was obtained in No.149, followed by No.152 (9.19 mm). The shortest (8.49 mm) was noted in No.151, followed by No.147 (8.62 mm). Average and its standard deviations through the whole strains were found to be 9.16 ± 0.61 . In the standard deviations of each strain, the largest (0.67) was obtained in No.151, followed by No.147 (0.61). The smallest (0.13) was noted in No.149, followed by No.152 (0.15). Average and its standard deviations in the whole strains were found to be 0.33 ± 0.21 .

Whole: Average and its standard deviations through the whole strains of both of the groups (= 41) were found to be 8.76 ± 0.44 . Standard deviations of each strain were found to be 0.26 ± 0.15 .

2. Widths

Group A: Widths for the individual grain level ranged from 2.90 mm (No.129) to 1.90 mm (No.135). In the strain level, the widest (2.69 mm) was obtained in No.127, followed by No.114 (2.66 mm) and No.99 (2.62 mm). The narrowest (2.02 mm) was noted in No.140, followed by No.112 (2.14 mm) and Nos.126 and 135 (2.22 mm). Average and its standard deviations through the whole strains were found to be 2.40 ± 0.15 . In the standard deviations of each strain, the largest (0.19) was obtained in No.135, followed by No.136 (0.16) and No.133 (0.15). The smallest (0.02) was noted in No.100, followed by No.119 (0.04) and Nos.96, 124 and 126 (0.05). Average and its standard deviations in the whole strains were found to be 0.09 ± 0.04 .

Group B: Widths for the individual grain level ranged from 2.95 mm (No.149), which was the same as in case of the length, to 2.15 mm (No.147). In the strain level, the widest (2.83 mm) was obtained in No.149, which was also the same as in case of the length, followed by No.152 (2.75 mm). The narrowest (2.31 mm) was noted in No.147, followed by No.151 (2.38 mm). Average and its standard deviations through the whole strains were found to be 2.57 ± 0.18 . In the standard deviations of each strain, the largest (0.16) was obtained in No.154, followed by No.147 (0.15). The smallest (0.03) was noted in No.152, followed by No.149 (0.07). Average and its standard deviations in the whole strains were found to be 0.09 ± 0.05 .

Whole: Average and its standard deviations through the whole strains of both of the groups were found to be 2.43 ± 0.17 . Standard deviations of each strain were found to be 0.09 ± 0.04 .

3. Thicknesses

Group A: Thicknesses for the individual grain level ranged from 1.85 mm (No.129),

which was the same as in case of the width, to 1.15 mm (No.116). In the strain level, the thickest (1.81 mm) was obtained in No.129, followed by No.127 (1.80 mm) and No.114 (1.66 mm). The thinnest (1.26 mm) was noted in No.116, followed by No.126 (1.40 mm). Average and its standard deviations through the whole strains were found to be 1.60 ± 0.10 . In the standard deviations of each strain, the largest (0.15) was obtained in No.116, followed by Nos.124 and 137 (0.13). The smallest (0.00) was noted in No.127, followed by Nos.94, 96, 99, 112 and 129 (0.02). Average and its standard deviations in the whole strains were found to be 0.06 ± 0.06 .

Group B: Thicknesses for the individual grain level ranged from 1.85 mm (Nos.149, 152, 154 and 155) to 1.50 mm (No.147), which was the same as in case of the width. In the strain level, the thickest (1.81 mm) was obtained in No.152, followed by No.149 (1.80 mm). The thinnest (1.52 mm) was noted in No.147, which was the same as in case of the width, followed by Nos.144 and 151 (1.61 mm). Average and its standard deviations through the whole strains were found to be 1.69 ± 0.11 . In the standard deviations of each strain, the largest (0.08) was obtained in No.155, followed by No.154 (0.06). The smallest (0.02) was noted in Nos.147 and 152. Average and its standard deviations in the whole strains were found to be 0.04 ± 0.02 .

Whole: Average and its standard deviations through the whole strains of both of the groups were found to be 1.62 ± 0.11 . Standard deviations of each strain were found to be 0.06 ± 0.03 .

4. Ratios of length to width

Group A: Ratios of length to width (abbreviated as L/W) for the individual grain level ranged from 4.69 (No.140) to 2.98 (No.99). In the strain level, the largest (4.56) was obtained in No.140, followed by No.112 (4.14) and No.93 (4.09). The smallest (3.06) was noted in No.99, followed by No.129 (3.23) and No.94 (3.24). Average and its standard deviations through the whole strains were found to be 3.64 ± 0.28 . In the standard deviations of each strain, the largest (0.39) was obtained in No.135, which was the same as in case of the width, followed by No.95 (0.32) and No.126 (0.27). The smallest (0.05) was noted in Nos.96, 124 and 129. Average and its standard deviations in the whole strains were found to be 0.16 ± 0.08 .

Group B: L/W for the individual grain level ranged from 4.54 (No.147) to 3.26 (Nos.154 and 155). In the strain level, the largest (3.76) was obtained in No.147, followed by No.144 (3.73). The smallest (3.34) was noted in No.152, followed by No.155 (3.35). Average and its standard deviations through the whole strains were found to be 3.58 ± 0.16 . In the standard deviations of each strain, the largest (0.47) was obtained in No.147, followed by No.151 (0.29). The smallest (0.04) was noted in No.152, which was the same as in case of the width, followed by Nos.149 and 155 (0.05). Average and its standard deviations in the whole strains were found to be 0.19 ± 0.15 .

Whole: Average and its standard deviations through the whole strains of both of the groups were found to be 3.63 ± 0.26 . Standard deviations of each strain were found to be 0.17 ± 0.10 .

5. Ratios of length to thickness

Group A: L/T for the individual grain level ranged from 7.48 (No.116) to 4.45 (No.126), which was the same as in case of the length. In the strain level, the largest (6.77) was obtained in No.116, followed by No.96 (5.90) and No.112 (5.79). The smallest (4.74) was noted in No.99, which was the same as in case of the L/W, followed by No.94 (4.90) and No.129 (4.96). Average and its standard deviations through the whole strains were found to be 5.45 ± 0.35 . In the standard deviations of each strain, the largest (0.96) was obtained in No.126, which was the same as in case of the length, followed by No.116 (0.65) and No.95 (0.42). The smallest (0.12) was noted in No.111, followed by Nos.97 and 100 (0.13). Average and its standard deviations in the whole strains were found to be 0.27 ± 0.17 .

Group B: L/T for the individual grain level ranged from 6.29 (No.147), which was the same as in case of the L/W, to 4.81 (No.155). In the strain level, the largest (5.85) was obtained in No.149, which was the same as in cases of the length and width, followed by No.144 (5.70). The smallest (5.08) was noted in No.152, which was the same as in case of the L/W, followed by No.154 (5.12). Average and its standard deviations through the whole strains were found to be 5.42 ± 0.29 . In the standard deviations of each strain, the largest (0.45) was obtained in No.151, which was the same as in case of the length, followed by No.155 (0.36) and No.147 (0.33). The smallest (0.07) was noted in No.152, which was the same as in cases of the width and L/W, followed by No.149 (0.11). Average and its standard deviations in the whole strains were found to be 0.25 ± 0.14 .

Whole: Average and its standard deviations through the whole strains of both of the groups were found to be 5.44 ± 0.34 . Standard deviations of each strain were found to be 0.27 ± 0.16 .

6. Ratios of width to thickness

Group A: W/T for the individual grain level ranged from 2.35 (No.116), which was the same as in case of the L/T, to 1.18 (No.140). In the strain level, the largest (2.04) was obtained in No.116, which was the same as in case of the L/T, followed by Nos.95 and 139 (1.61). The smallest (1.25) was noted in No.140, followed by No.93 (1.33) and No.112 (1.40). Average and its standard deviations through the whole strains were found to be 1.51 ± 0.12 . In the standard deviations of each strain, the largest (0.17) was obtained in No.126, which was the same as in cases of the length and L/T, followed by No.133 (0.15) and Nos.95 and 135 (0.14). The smallest (0.03) was noted in Nos.100 and 123, followed by Nos.96 and 112 (0.04). Average and its standard deviations in the whole strains were found to be 0.08 ± 0.05 .

Group B: W/T for the individual grain level ranged from 1.72 (No.155), which was the same as in case of the thickness, to 1.32 (No.154), which was the same as in case of the L/W. In the strain level, the largest (1.57) was obtained in No.149, which was the same as in cases of the length, width and L/T, followed by No.155 (1.56). The smallest (1.43) was noted in No.154, followed by No.151 (1.48). Average and its standard deviations through the whole strains were found to be 1.52 ± 0.04 . In the standard deviations

of each strain, the largest (0.12) was obtained in No.147, which was the same as in case of the L/W, followed by No.151 (0.07). The smallest (0.01) was noted in No.152, which was the same as in cases of the width, L/W and L/T, followed by No.149 (0.04). Average and its standard deviations in the whole strains were found to be 0.07 ± 0.03 .

Whole: Average and its standard deviations through the whole strains of both of the groups were found to be 1.51 ± 0.11 . Standard deviations of each strain were found to be 0.08 ± 0.05 .

II. *Oryza breviligulata*

I. Lengths

Group A: The results are given in Table 3. Lengths for the individual grain level ranged from 10.70 mm (strain No.122) to 8.00 mm (No.117). In the strain level, the longest (10.34 mm) was obtained in No.122, followed by No.118 (9.62 mm) and No.110 (9.51 mm). It was noticeable that No.122 showed very large value. The shortest (8.15 mm) was noted in Nos. 103 and 117, followed by No.98 (9.16 mm). It was noticeable that Nos.103 and 117 showed very small values. Average and its standard deviations through the whole strains were found to be 8.99 ± 0.58 . In the standard deviations of each strain, *i.e.*, showing intra-population's variations, the largest (0.34) was obtained in

Table 3. Six morphological characters of unhusked grains; *O. breviligulata* and *O. brachyantha* (W175)

Strain No.	Length (mm)	Width (mm)	Thickness (mm)	L/W	L/T	W/T
98	9.16±0.34	2.82±0.04	1.87±0.07	3.25±0.13	4.90±0.24	1.51±0.06
103	8.15±0.08	2.73±0.14	1.84±0.05	2.99±0.12	4.43±0.13	1.49±0.10
104	8.76±0.20	3.04±0.04	1.71±0.07	2.88±0.08	5.13±0.29	1.78±0.09
105	8.41±0.18	3.17±0.08	1.81±0.07	2.66±0.09	4.65±0.12	1.76±0.09
110	9.51±0.19	3.09±0.07	1.71±0.06	3.08±0.05	5.57±0.22	1.81±0.08
113	9.46±0.21	3.03±0.08	1.90±0.03	3.12±0.05	4.98±0.16	1.60±0.05
115	9.44±0.09	3.32±0.05	1.60±0.08	2.84±0.05	5.92±0.32	2.08±0.13
117	8.15±0.16	3.11±0.05	1.97±0.04	2.62±0.09	4.14±0.08	1.58±0.05
118	9.62±0.21	2.89±0.11	1.81±0.06	3.33±0.11	5.32±0.16	1.60±0.01
121	8.33±0.14	3.21±0.04	2.08±0.04	2.60±0.06	4.01±0.09	1.54±0.02
122	10.34±0.20	2.54±0.06	1.73±0.02	4.07±0.15	5.98±0.08	1.47±0.05
125	8.98±0.27	2.80±0.06	1.82±0.05	3.21±0.09	4.94±0.24	1.54±0.06
128	8.65±0.18	2.27±0.17	1.30±0.11	3.83±0.31	6.70±0.58	1.77±0.26
130	8.78±0.08	2.87±0.04	1.83±0.04	3.06±0.04	4.80±0.11	1.57±0.05
132	8.91±0.13	2.91±0.07	1.86±0.05	3.06±0.06	4.79±0.16	1.57±0.07
138	9.46±0.30	2.87±0.02	1.70±0.03	3.30±0.09	5.57±0.15	1.69±0.03
142	8.70±0.27	2.71±0.09	1.68±0.02	3.21±0.10	5.18±0.18	1.61±0.05
143	8.53±0.19	3.05±0.14	2.00±0.03	2.80±0.16	4.27±0.10	1.53±0.08
145	9.06±0.17	3.35±0.14	2.00±0.06	2.71±0.10	4.53±0.10	1.68±0.09
146	8.70±0.11	3.08±0.15	1.93±0.07	2.83±0.16	4.51±0.20	1.60±0.06
148	8.47±0.11	3.29±0.15	1.99±0.07	2.58±0.09	4.26±0.11	1.65±0.02
150	10.47±0.28	3.05±0.16	1.87±0.05	3.44±0.20	5.60±0.17	1.63±0.11
153	8.29±0.17	3.24±0.07	1.93±0.09	2.56±0.07	4.30±0.19	1.68±0.10
156	8.58±0.39	3.07±0.09	1.91±0.07	2.80±0.18	4.50±0.22	1.61±0.05
175	9.01±0.33	1.82±0.08	1.40±0.12	4.96±0.29	6.50±0.66	1.31±0.13

No.98, followed by No.138 (0.30) and Nos. 125 and 142 (0.27). The smallest (0.08) was noted in Nos.103 and 130, followed by No.115 (0.09). Average and its standard deviations in the whole strains were found to be 0.19 ± 0.07 .

Group B: Lengths for the individual grain level ranged from 10.80 mm (No.150) to 7.85 mm (No.156). In the strain level, the longest (10.47 mm) was obtained in No.150, followed by No.145 (9.06 mm). It was noted that No.150 showed very large value. The shortest (8.29 mm) was noted in No.153, followed by No.148 (8.47 mm). Average and its standard deviations through the whole strains were found to be 8.87 ± 0.69 . In the standard deviations of each strain, the largest (0.39) was obtained in No.156, followed by No.150 (0.28). The smallest (0.11) was noted in Nos.146 and 148. Average and its standard deviations in the whole strains were found to be 0.20 ± 0.09 .

Whole: Average and its standard deviations through the whole strains of both of the groups (= 24) were found to be 8.96 ± 0.61 . Standard deviations of each strain were found to be 0.19 ± 0.08 .

2. Widths

Group A: Widths for the individual grain level ranged from 3.40 mm (No.115) to 2.00 mm (No.128). In the strain level, the widest (3.32 mm) was obtained in No.115, followed by No.121 (3.21 mm) and No.105 (3.17 mm). The narrowest (2.27 mm) was noted in No.128, followed by No.122 (2.54 mm) and No.142 (2.71 mm). Average and its standard deviations through the whole strains were found to be 2.91 ± 0.25 . In the standard deviations of each strain, the largest (0.17) was obtained in No.128, followed by No.103 (0.14) and No.118 (0.11). The smallest (0.02) was noted in No.138, followed by Nos.98, 104 and 121 (0.04). Average and its standard deviations in the whole strains were found to be 0.07 ± 0.04 .

Group B: Widths for the individual grain level ranged from 3.45 mm (No.145) to 2.75 mm (No.150). In the strain level, the widest (3.35 mm) was obtained in No.145, followed by No.148 (3.29 mm). The narrowest (3.05 mm) was noted in Nos.143 and 150. Average and its standard deviations through the whole strains were found to be 3.16 ± 0.12 . In the standard deviations of each strain, the largest (0.16) was obtained in No.150, followed by Nos.146 and 148 (0.15). The smallest (0.07) was noted in No.153, followed by No.156 (0.09). Average and its standard deviations in the whole strains were found to be 0.13 ± 0.03 .

Whole: Average and its standard deviations through the whole strains of both of the groups were found to be 2.98 ± 0.25 . Standard deviations of each strain were found to be 0.09 ± 0.05 .

3. Thicknesses

Group A: Thicknesses for the individual grain level ranged from 2.10 mm (No.121) to 1.15 mm (No.128), which was the same as in case of the width. In the strain level, the thickest (2.08 mm) was obtained in No.121, followed by No.117 (1.97 mm) and No.113 (1.90 mm). The thinnest (1.30 mm) was noted in No.128, which was the same as in case of the width, followed by No.142 (1.68 mm) and No.138 (1.70 mm). Average and its standard deviations through the whole strains were found to be 1.78 ± 0.16 . In the stand-

ard deviations of each strain, the largest (0.11) was obtained in No.128, which was the same as in case of the width, followed by No.115 (0.08). The smallest (0.02) was noted in Nos. 122 and 142, followed by Nos.113 and 138 (0.03). Average and its standard deviations in the whole strains were found to be 0.05 ± 0.02 .

Group B: Thicknesses for the individual grain level ranged from 2.05 mm (Nos.143, 145, 146, 148 and 153) to 1.80 mm (Nos.150, 153 and 156). In the strain level, the thickest (2.00 mm) was obtained in Nos.143 and 145. The thinnest (1.87 mm) was noted in No.150, followed by No.156 (1.91 mm). Average and its standard deviations through the whole strains were found to be 1.95 ± 0.05 . In the standard deviations of each strain, the largest (0.09) was obtained in No.153. The smallest (0.03) was noted in No.143, followed by No.150 (0.05). Average and its standard deviations in the whole strains were found to be 0.06 ± 0.02 .

Whole: Average and its standard deviations through the whole strains of both of the groups were found to be 1.83 ± 0.16 . Standard deviations of each strain were found to be 0.06 ± 0.02 .

4. Ratios of length to width

Group A: Ratios of length to width (abbreviated as L/W) for the individual grain level ranged from 4.40 (No.128) to 2.49 (Nos.105 and 121). In the strain level, the largest (4.07) was obtained in No.122, which was the same as in case of the length, followed by No.128 (3.83) and No.118 (3.33). The smallest (2.60) was noted in No.121, followed by No.117 (2.62) and No.105 (2.66). Average and its standard deviations through the whole strains were found to be 3.12 ± 0.38 . In the standard deviations of each strain, the largest (0.31) was obtained in No.128, which was the same as in cases of the width and thickness, followed by No.122 (0.15) and No.98 (0.13). The smallest (0.04) was noted in No.130, followed by Nos.110, 113 and 115 (0.05). Average and its standard deviations in the whole strains were found to be 0.10 ± 0.06 .

Group B: L/W for the individual grain level ranged from 3.78 (No.150), which was the same as in case of the length, to 2.46 (No.153). In the strain level, the largest (3.44) was obtained in No.150, which was also the same as in case of the length, followed by No.146 (2.83). The smallest (2.56) was noted in No.153, which was also the same as in case of the length, followed by No.148 (2.58). Average and its standard deviations through the whole strains were found to be 2.82 ± 0.27 . In the standard deviations of each strain, the largest (0.20) was obtained in No.150, which was the same as in case of the width, followed by No.156 (0.18). The smallest (0.07) was noted in No.153, which was the same as in case of the width, followed by No.148 (0.09). Average and its standard deviations in the whole strains were found to be 0.14 ± 0.05 .

Whole: Average and its standard deviations through the whole strains of both of the groups were found to be 3.04 ± 0.38 . Standard deviations of each strain were found to be 0.11 ± 0.06 .

5. Ratios of length to thickness

Group A: L/T for the individual grain level ranged from 7.70 (No.128), which was the same as in case of the L/W, to 3.86 (No.121), which was also the same as in case of

the L/W. In the strain level, the largest (6.70) was obtained in No.128, followed by No.122 (5.98) and No.115 (5.92). The smallest (4.01) was noted in No.121, which was the same as in case of the L/W, followed by No.117 (4.14) and No.103 (4.43). Average and its standard deviations through the whole strains were found to be 5.12 ± 0.67 . In the standard deviations of each strain, the largest (0.58) was obtained in No.128, which was the same as in cases of the width, thickness and L/W, followed by No.115 (0.32) and No.104 (0.29). The smallest (0.08) was noted in Nos.117 and 122, followed by No.121 (0.09). Average and its standard deviations in the whole strains were found to be 0.20 ± 0.12 .

Group B: L/T for the individual grain level ranged from 5.84 (No.150), which was the same as in cases of the length and L/W, to 4.02 (No.153), which was the same as in case of the L/W. In the strain level, the largest (5.60) was obtained in No.150, which was the same as in cases of the length and L/W, followed by No.145 (4.53). The smallest (4.26) was noted in No.148, followed by No.143 (4.27). Average and its standard deviations through the whole strains were found to be 4.57 ± 0.44 . In the standard deviations of each strain, the largest (0.22) was obtained in No.156, which was the same as in case of the length, followed by No.146 (0.20). The smallest (0.10) was noted in Nos.143 and 145. Average and its standard deviations in the whole strains were found to be 0.16 ± 0.05 .

Whole: Average and its standard deviations through the whole strains of both of the groups were found to be 4.96 ± 0.66 . Standard deviations of each strain were found to be 0.18 ± 0.10 .

6. Ratios of width to thickness

Group A: W/T for the individual grain level ranged from 2.31 (No.115), which was the same as in case of the width, to 1.37 (No.103). In the strain level, the largest (2.08) was obtained in No.115, which was also the same as in case of the width, followed by No.110 (1.81) and No.104 (1.78). The smallest (1.47) was noted in No.122, followed by No.103 (1.49) and No.98 (1.51). Average and its standard deviations through the whole strains were found to be 1.65 ± 0.15 . In the standard deviations of each strain, the largest (0.26) was obtained in No.128, which was the same as in cases of the width, thickness, L/W and L/T, followed by No.115 (0.13) and No.103 (0.10). The smallest (0.01) was noted in No.118, followed by No.121 (0.02) and No.138 (0.03). Average and its standard deviations in the whole strains were found to be 0.07 ± 0.06 .

Group B: W/T for the individual grain level ranged from 1.82 (No.145), which was the same as in case of the width, to 1.37 (No.143). In the strain level, the largest (1.68) was obtained in Nos.145 and 153. The smallest (1.53) was noted in No.143, which was the same as in case of the width, followed by No.146 (1.60). Average and its standard deviations through the whole strains were found to be 1.58 ± 0.09 . In the standard deviations of each strain, the largest (0.11) was obtained in No.150, which was the same as in cases of the width and L/W, followed by No.153 (0.10). The smallest (0.02) was noted in No.148, followed by No.156 (0.05). Average and its standard deviations in the whole strains were found to be 0.07 ± 0.03 .

Whole: Average and its standard deviations through the whole strains of both of the groups were found to be 1.64 ± 0.13 . Standard deviations of each strain were found to be 0.07 ± 0.05 .

III. *Oryza brachyantha*

The results are given also in Table 3. Lengths for the individual grain level ranged from 9.60 mm to 8.60 mm. Average and its standard deviations in the whole grains were found to be 9.01 ± 0.33 . Widths for the individual grain level ranged from 1.95 mm to 1.60 mm. Average and its standard deviations in the whole grains were found to be 1.82 ± 0.08 . Thicknesses for the individual grain level ranged from 1.55 mm to 1.20 mm. Average and its standard deviations in the whole grains were found to be 1.40 ± 0.12 .

Ratios of length to width (abbreviated as L/W) for the individual grain level ranged from 5.49 to 4.46. Average and its standard deviations in the whole grains were found to be 4.96 ± 0.29 . Ratios of length to thickness (L/T) for the individual grain level ranged from 8.00 to 5.55. Average and its standard deviations in the whole grains were found to be 6.50 ± 0.66 . Ratios of width to thickness (W/T) for the individual grain level ranged from 1.58 to 1.13. Average and its standard deviations in the whole grains were found to be 1.31 ± 0.13 .

Summary

During the trip from October to November in 1985 in Senegal, 67 strains of wild rice, *i.e.*, 42 of *Oryza longistaminata* CHEV. et ROEHR., 24 of *Oryza breviligulata* CHEV. et ROEHR., and 1 of *Oryza brachyantha* CHEV. et ROEHR., were collected and many populations of the former 2 species were observed. Their localities and habitats were reported in detail. Locality names are as follows; Ziguinchor, Simbandi, Tanaff, Kolda, Saresara, Tiapa, Anambe, Sefa, Bounkiling, Tangouri, Bignona, Kafoutine, Dioloulou, Goudomp, Biaoobe, St. Louis, Richard Toll, lac du Guiners, Matam, Nianga, N'Dioum; Bassè, Faraba Banta, Kafuta, Brikama (GAMBIA).

Strains of *O. longistaminata* and *O. breviligulata* were divided into two groups, *i.e.*, Group A --- strains collected in southern part of Senegal (Casamance), Group B --- strains collected in northern part of Senegal (Matam).

In case of *O. longistaminata*, lengths, widths, thicknesses, ratios of length to width, ratios of length to thickness, ratios of width to thickness, were found to 8.68 mm, 9.16 mm, 8.76 mm; 2.40 mm, 2.57 mm, 2.43 mm; 1.60 mm, 1.69 mm, 1.62 mm; 3.64, 3.58, 3.63; 5.45, 5.42, 5.44; 1.51, 1.52, 1.51 in Group A, Group B and through the both groups, in the average values, respectively. It may be noticeable that the population of No.149, collected in upland field near Matam, showed large values in length, width, L/T and W/T.

In case of *O. breviligulata*, these values were found to be 8.99 mm, 8.87 mm, 8.96 mm; 2.91 mm, 3.16 mm, 2.98 mm; 1.78 mm, 1.95 mm, 1.83 mm; 3.12, 2.82, 3.04; 5.12, 4.57, 4.96; 1.65, 1.58, 1.64 in the same order in Group A, Group B and through the

both groups, respectively. It may be noticeable that the populations of Nos.122 and 150, collected in paddy field near Biaobe and in upland field near Matam, respectively, showed large values in length and L/W.

Average values of *O. brachyantha* were found to be 9.01 mm, 1.82 mm, 1.40 mm, 4.96, 6.50 and 1.31 in length, width, thickness, ratios of length to width, of length to thickness, and of width to thickness, in average values, respectively.

In the analyses of the data obtained in the field survey, morphological and genetical characters, ecotypic and varietal differentiations may be discussed in the future.

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