ALAYN LP-26. New cultivar of rice (Oryza sativa L.) obtained by in vitro anther culture

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ABSTRACT
At Scientific and Technological Base Unit (UCTB) “Los Palacios” belonging to the National Institute of Agricultural Sciences (INCA), a new medium-cycle rice cultivar (named ALAYN LP-26) was obtained by biotechnological methods (in vitro cultivation of anthers from a selection of Eduar LP-21 cultivar), with excellent morphoagronomic characteristics in terms of agricultural yield (7.4 t ha⁻¹ in the low rainy season and 6.2 t ha⁻¹ in the rainy season), milling quality with 59 % of whole grains and resistance to pests (highly resistant to Tagosodes orizicolus), as well as good yield under conditions of low water supply. With this new cultivar, UCTB expects to favor rice producers in the peasant cooperative sector.

Key words: rice, biotechnology, adaptability

INTRODUCTION
In the world, phytogenetic resources are considered very limited and constitute the basis for obtaining new cultivars with adaptability, high productivity and resistance to biotic and abiotic factors. Cuba has an organized program, with state support, which relies on the work carried out by institutions that make up the national system of phytogenetic resources.

In Cuba, rice is one of the main foods for population, due to the great consumption habit, reporting an annual per capita of 72 kg, well above almost all the countries of the American continent and close to the consumption patterns of some Asian countries, so Cuban state prioritizes the development of the national program of plant breeding,
which promotes research aimed at the conservation, use and enrichment of breeding programs, through the establishment and increase of germplasm collections of current economic importance species and to promote the development of new varieties or hybrids that contribute to achieving agricultural sustainability in the country. For this reason, genetic breeding programs are being developed, mainly aimed at obtaining rice cultivars for low water supply conditions with greater productive potential and resistance to the main pests.

The aim of the present work is to divulge a new medium cycle rice cultivar, obtained in Cuba, by biotechnological methods (in vitro anther culture) for conditions of low water supply for Cuban soils.

**DESCRIPTION**

At Scientific and Technological Base Unit (UCTB) “Los Palacios”, belonging to the National Institute of Agricultural Sciences (INCA), a genetic breeding program was carried out with the fundamental objective of diversifying the varietal composition of the rice crop. A new medium-cycle cultivar named ALAYN LP-26 was obtained through the use of biotechnological methods (in vitro culture of anthers of F$_2$ plants), using the hybrid combination INCA LP-10/C4 153 and the evaluation of agronomic traits in superior regionalization trials.

Studies conducted in seven localities of the Cooperative Farmer sector, during six years, have shown a good performance of this cultivar, in relation to agricultural and industrial yield, as well as its tolerance to main pests. Among its most important characteristics is its tolerance to low water supplies, where the following management was carried out, establishment of the lamina 15 days after germination of the rice, suspension of the entry 35 days after germination and replacement at the change of primordium, until after 50% of flowering. In addition, it is worth noting that it has an excellent performance in waterlogged conditions.

Thirty-two descriptors were evaluated at different stages of the crop (vegetative stage, reproductive stage and ripening stage), including both qualitative and quantitative characteristics (Table 1), using the methodologies Standard Evaluation System for Rice (IRRI, 2002), CIAT Varietal Descriptors, 1993 and Varietal Description Form for Rice (Variety Registration and Seed Certification, 1998).
Table 1. Qualitative and quantitative characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vigor</td>
<td>Very vigorous</td>
</tr>
<tr>
<td>Growth habit</td>
<td>Erect</td>
</tr>
<tr>
<td>Stem height (cm)</td>
<td>84</td>
</tr>
<tr>
<td>Leaf blade length (cm)</td>
<td>55</td>
</tr>
<tr>
<td>Leaf width (cm)</td>
<td>1.4</td>
</tr>
<tr>
<td>Predominant leaf color</td>
<td>Dark green</td>
</tr>
<tr>
<td>Ageing of leaf at flowering stage</td>
<td>Do not age</td>
</tr>
<tr>
<td>Pod color</td>
<td>Dark green</td>
</tr>
<tr>
<td>Flag leaf growth habit</td>
<td>Erect 0 - 30 degree</td>
</tr>
<tr>
<td>Predominant color of ligule</td>
<td>Whitish yellow</td>
</tr>
<tr>
<td>Ligule length (mm)</td>
<td>2.5 (none or very short)</td>
</tr>
<tr>
<td>Ligule shape</td>
<td>Cleft</td>
</tr>
<tr>
<td>Auricle color</td>
<td>Whitish white</td>
</tr>
<tr>
<td>Stigma color in spikelet</td>
<td>Yellowish white</td>
</tr>
<tr>
<td>Color of glumes</td>
<td>Whitish</td>
</tr>
<tr>
<td>Length of glumes (mm)</td>
<td>2.5</td>
</tr>
<tr>
<td>Leaf lamina corrugation</td>
<td>Absent</td>
</tr>
<tr>
<td>Color of lemma and palea</td>
<td>Light green</td>
</tr>
<tr>
<td>Panicle density</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Panicle length (cm)</td>
<td>28.5</td>
</tr>
<tr>
<td>Panicle shape and erection</td>
<td>Equilateral pendant</td>
</tr>
<tr>
<td>Length of shelled grains (mm)</td>
<td>Long (10.36)</td>
</tr>
<tr>
<td>Width of shelled grains (mm)</td>
<td>Hemispherical (2.75)</td>
</tr>
<tr>
<td>Exersion of panicle</td>
<td>Emerged</td>
</tr>
<tr>
<td>Weight of 1000 unhulled kernels (g)</td>
<td>Very tall (30)</td>
</tr>
<tr>
<td>Full grains per panicle</td>
<td>125</td>
</tr>
<tr>
<td>Resistance to lodging</td>
<td>Resistant</td>
</tr>
<tr>
<td>Resistance to shattering</td>
<td>Resistant</td>
</tr>
<tr>
<td>Potential yield of paddy rice (t ha(^{-1}))</td>
<td>Dry-7.4 and rain-6.2</td>
</tr>
<tr>
<td>Brown rice % Whole rice</td>
<td>67</td>
</tr>
<tr>
<td>Percentage of whole grains</td>
<td>59</td>
</tr>
<tr>
<td>Fertile tiller m(^2)</td>
<td>380</td>
</tr>
<tr>
<td>Resistance to <em>Pyricularia grisea</em></td>
<td>Resistant</td>
</tr>
<tr>
<td>Resistance to <em>Tagosodes orizicolus</em></td>
<td>Resistant</td>
</tr>
</tbody>
</table>