

Investigation on sources of variability in aromatic quality of a famous traditional scented rice variety grown in Mekong Delta.

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Introduction

Nang Thom Cho Dao (NTCD) is a famous traditional scented rice variety in South Vietnam. Nevertheless, consumers often complain about poor and/or variable quality of NTCD sold on markets. Producers give two reasons to explain this. First, they claim that retailers are mixing NTCD with low quality varieties. Secondly, they say that quality, especially aroma, of NTCD is strongly affected by growing conditions and consequently is highly variable within the production area of NTCD. **Our works aimed at characterizing the variability of NTCD aromatic quality at market and field level, and identify possible factors responsible for variation of aromatic quality of NTCD at fields level.**

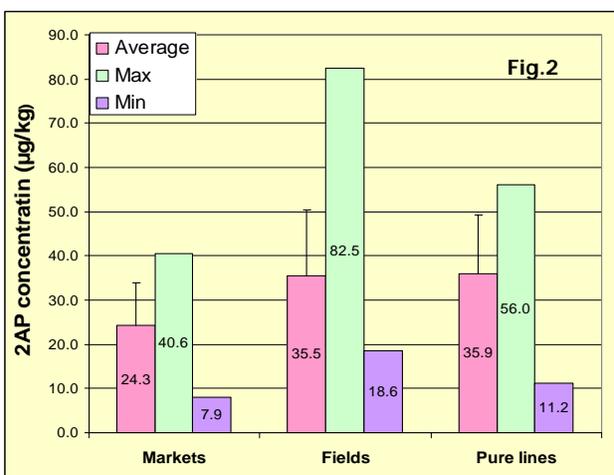
Material & methods

- 63 samples of NTCD were collected after the crop season 2005-2006 for traditional rice varieties : 17 came from retail markets of Ho Chi Minh city, 31 from farmers' fields within the production area of NTCD variety, 15 from an experimental field on which different lines of NTCD used by farmers had been evaluated.
- Aromatic quality of these samples was assessed by the grain concentration of 2-acetyl-1-pyrroline (2AP), the main volatile compound of rice aroma, analysed by solid phase micro extraction (SPME, Fig.1) combined with gas chromatography (GC). Every sample was analysed twice.
- Information about growing conditions and crop management in the production area of NTCD were collected through farmer and field surveys conducted during the crop seasons 2004-2005 and 2005-2006.



Fig.1 SPME device

Results & Discussion



1. Variability of 2AP concentration

Concentration of 2AP ranges from 7.9 to 82.5 µg/kg (Fig.2) with highest value found in samples from farmers' fields and lowest one in samples from the markets. The average 2AP content in samples from the markets is significantly lower than average 2AP content found in farmers' fields and in pure lines. These differences can be put down on post-harvest processing especially storage conditions and length as samples from markets were collected several months after the one from farmers' fields.

CV are similar for the three batches of samples (40, 42% and 37% respectively). It means that (i) aromatic quality of NTCD on markets is not as much variable as in fields, and (ii) variability at field level can be partly explain by genetic variability regarding aromatic quality of the different NTCD lines used by farmers.

2. Growing conditions and crop management in production area of NTCD

We calculated average and coefficient of variation for the quantitative parameters we collected through farmers and fields surveys. **Several soil and crop management factors are highly variable within the production area of NTCD (Table 1).** These results are consistent with assumptions found in literature about effects of soil fertility (soil organic matter), soil salinity (EC), micro-elements and water stress (drainage time, sand content in soil) on aroma of rice. Further works have to be carried out to investigate relationships between those factors and aromatic quality of NTCD.

Table 1			Average	CV	Max	Min
Soil factors	Loam	%	19.8	21%	28.6	16.4
	Sands	%	14.2	30%	19.8	8.1
	EC	(mS/cm ²)	0.7	31%	1.2	0.5
	Organic matter	%	1.6	35%	2.6	1.0
	Total Fe	%	2.62	23%	3.3	1.8
	Total Cu	%	0.015	22%	0.021	0.011
	Total Mn	%	0.066	35%	0.105	0.037
Crop management factors	Total N apply	kg/ha	49	30%	85	18
	Total P apply	kg/ha	45	72%	155	0
	Total K apply	kg/ha	25	58%	73	0
	Drainage time before harvest	days	18	77%	40	0
	Nursery rate	kg/ha	33	38%	50	10
	Transplanting spacing	plant/m ²	19	21%	25	11

