ASTRAGALINE LEVELS IN CREOLE AND BREEDING LINES OF COMMON BEAN FROM RIO GRANDE DO SUL STATE, BRAZIL

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INTRODUCTION

The common bean isoneof the mainfoods in the dietof Brazilians, being able to supplyan important part ofmanyimportant substancesin maintaining healthsuch as the antioxidants.

Besides being a source of essential nutrients, the beans have chemical constituents that are considered with action functional components such as flavonoids, including flavonols, glycosylated or not, anthocyanidins, proanthocyanidins and isoflavones and phenolic acids. Present in large amounts of vegetables, phenolic compounds are associated as chemical mediators between plants and microorganisms. Among these compounds, flavonoids are the most interesting because they are related to various functions such as protection, resistance to various types of stress, nitrogen fixation, among others (GONZALEZ de MEJIA et al., 2005).

The common beanhas someundesirableattributes, such asphytates, factorsflatulent, phenolic compounds, enzyme inhibitors, hemaglutinin(lectin) and allergenswhich mustbe eliminated forits effectiveuse as food(GUPTA, 1987). Thehighest concentration of polyphenolsis found in colored seed coats, and the peelwhite seedsand otheranatomical partsof the seedhave lowerconcentrations (BRESSANI et al., 1991).
Theobjective of this studywas to investigatethe behavior oflandraces andimprovedcultivarsof common beansfrom RioGrande do Sulfor the levels ofastragalina in whole grains.

MATERIAL AND METHODS

The field experimentwas conductedat the Cascata Experimental Stationof EmbrapaTemperate Climate,inPelotas, Rio Grande do Sul State in the year2009/2010, using300 kgha-1NPK fertilizer.The seeds were sownin October 2009and harvestingin February 2010. The seeds were driedand placedin cotton bagsduring thestorage period. Levelsof antioxidantastragalinalandraces andimprovedcultivarsof beans withdifferent colorsof the grain were analyzed, according Correia et al. (2006)..

The cultivarswere divided intotwo groups:thefirst group formed by thelandraces;the second by cultivars and breeding lines from differentbreeding programs.Data wasanalyzed using thestandard deviation; are consideredsuperior those genotypes whoobtaineda value exceedingthe mean plusonestandard deviation.

RESULTS AND DISCUSSION

The distributionof phenolic compoundswas quite variable, where thecultivarswith red andyellow seed coatspresented higher levelswhen compared to those with black seed coats,with the exception ofFTNobre andTB02-11.The cultivarFTNobreisrecognized as of a good nutrition quality, and TB02-11 is a breeding line. In this study the genotypesTB02-24 (10.632 mg/100 g), TB02-26 (11.550 mg/100 g), TB 02-20(5.000 mg/100 g) and Amarelinho Iolanda(3.791 mg/100 g), presented the highest astragaline content.
Study withfourdifferentcolorsof beans, using the technique ofHPLC/MSshowed thatthe highest level ofastragalinawasobserved in seeds ofnon-staining black(Hu etal., 2006). The landraces had mean values slightly higher than cultivars from breeding programs.
The methodfor quantification ofAstragalinawas validatedaccording to current regulations, and wasjustified inits purposes.

Table 1 – Astragaline levels in creole and breeding lines of common bean from Rio Grande do Sul State, Brazil. 2010.

Creole cultivar	Seed color	Astragaline (mg%)	Breeding line	Seed color	Astragaline (mg%)
Mouro Tavares 187	Purple	0,216	03 FPJ CF 29-1	Black	0,134
Mato Grosso	Black	0,799	FT Nobre	Black	11,050
Roxo Redondo	Purple	0,209	BRS Expedito	Black	0,142
Amarelo Iolanda	Yellow	3,791	BRS Valente	Black	0,094
AM 5	Black	0,015	Minuano	Black	0,100
Guabiju Brilhante	Black	0,079	Guapo Brilhante	Black	0,216
Rosinha Precoce	Black	2,581	Macanudo	Black	0,897
Preto Ibérico	Black	0,061	Macotaço	Black	0,076
Biriva 264	Black	0,221	BRS Pampeano	Black	0,027
TB 0220	Black	5,000	BRS Guerreiro	Black	0,165
TB 0221	Black	0,032	TB 0201	Black	0,025
TB 0222	Black	3,791	TB 0203	Black	0,665
TB 0223	Black	0,070	TB 0207	Black	0,059
TB 0224	Red	10,632	TB 0210	Black	0,045
TB 0225	Black	0,015	TB 0211	Black	10,502
TB 0226	Red	11,550	TB 0212	Black	0,294
TB 0301	Black	0,015	TB 0213	Bege	2,423
TB 0302	Black	0,048	TB 0219	Black	0,128
TB 0303	Black	0,067	Iraí	Cream	0,024
TB 0304	Cream	0,015	Carioca	Cream	0,058
TB 0305	Black	2,581			
TB 0306	Black	0,015			
TB 0307	Red	0,043			
TB 0308	Black	0,058			
TB 0309	Brown	0,392			
TB 0310	Red	0,068			
Media		1,571	Media		1,380
Standart deviation		3,087	Standart deviation		3,360

CONCLUSION: Among landraces, TB 02-26, TB 02-24, TB 02-20 and Amarelo Iolanda, and from cultivars and breeding lines, FT Nobre and TB 02-11 were those with higher levels of astragaline. The highest concentrations of astragaline were found in seeds with no black seed coats, although some black bean cultivars showed high levels.

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