

Proyecto
SAN Nariño
Seguridad Alimentaria y Nutrición



Phenolic compounds in raw and boiled yellow Colombian diploid potato genotypes

Clara-Janneth Piñeros-Niño¹, Elizabeth Moreno-Gómez², Juan-Nicolás Tarquino-Chía², Carlos-Eduardo Narváez-Cuenca², Teresa Mosquera-Vasquez¹
¹Faculty of Agronomy, National University of Colombia ²Chemical Department, Faculty of Sciences, National University of Colombia

Background

Potato (*Solanum tuberosum*) is the third crop in caloric input worldwide and a high potential as a source of secondary metabolites such as the phenolic compound (PC) group. It is known that non-anthocyanin hydroxycinnamic acid-like compounds (non-ACN-HCA-LC) is the main group of PC in yellow potato tubers. Although potato consumption pattern is changing, the main form of usage is boiled in water or similar preparations. Different authors had reported the change in the level of concentration nutritional compounds by boiling effect, which mainly affects phenolic compounds varying the concentration.

Objective

To evaluate the effect of boiling in the amount of non-ACN-HCA-LC in yellow potato genotypes of a breeding program .

Methods

Plant material

Phenolic compounds extraction

- Eight genotypes from Colombian core collection
- Sample preparation two sets: raw and boiled
- Dry freezing powder 50 mg
- Acidified methanol extraction
- Extraction for triplicate

- Dionex Ultimate 3000 UHPLC system (Thermo Scientific corp) coupled to DAD
- Column Thermo Scientific 150 mm x 2.1 mm; 1.9 μm, coupled to a precolumn (Thermo Scientific; 10 mm x 2 mm x 3 μm)
- Injection volume was 5 μL; flow 0.4 mL/min
- DAD was used for the detection at 325 nm
- Eluents used were water/ACN/Ac A (99:1:0.1, v/v/v) and ACN/Ac A (100:0.1, v/v).
- Identified by comparing the retention time and UV-vis spectral data with that of the standards.
- The standards employed were chlorogenic acid and isomers *neo*-chlorogenic acid, *crypto*-chlorogenic acid, and caffeic acid .
- Results were expressed as milligrams per 100 grams of dry weight (mg/100g DW).

Identification and quantification by UHPLC

Results

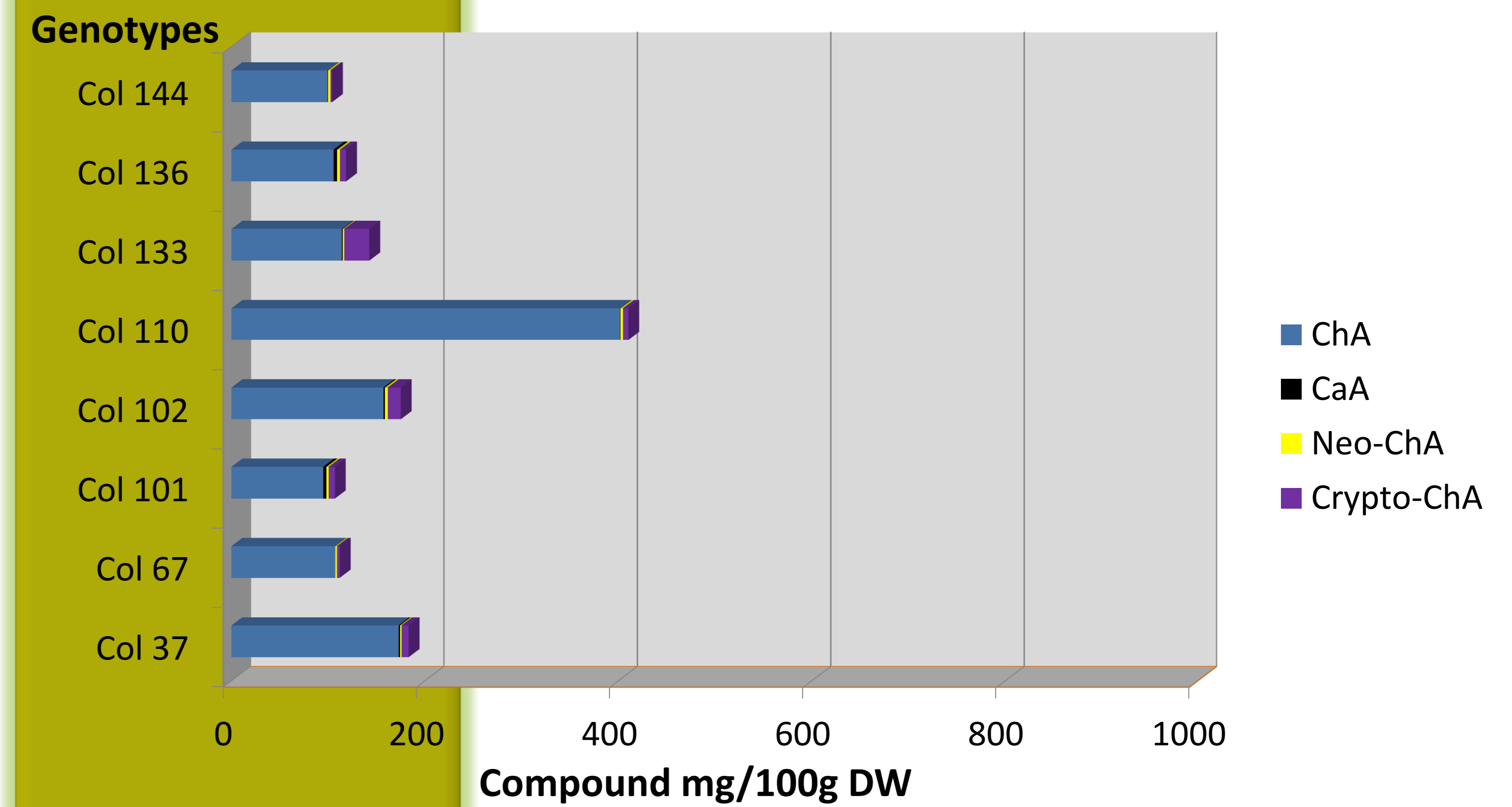


Figure 1. Concentration of non-ACN-HCA-LC in eight raw potato genotypes from Phureja group. Chlorogenic acid (ChA), *neo*-ChA, *crypto*-ChA, and caffeic acid (CaA).

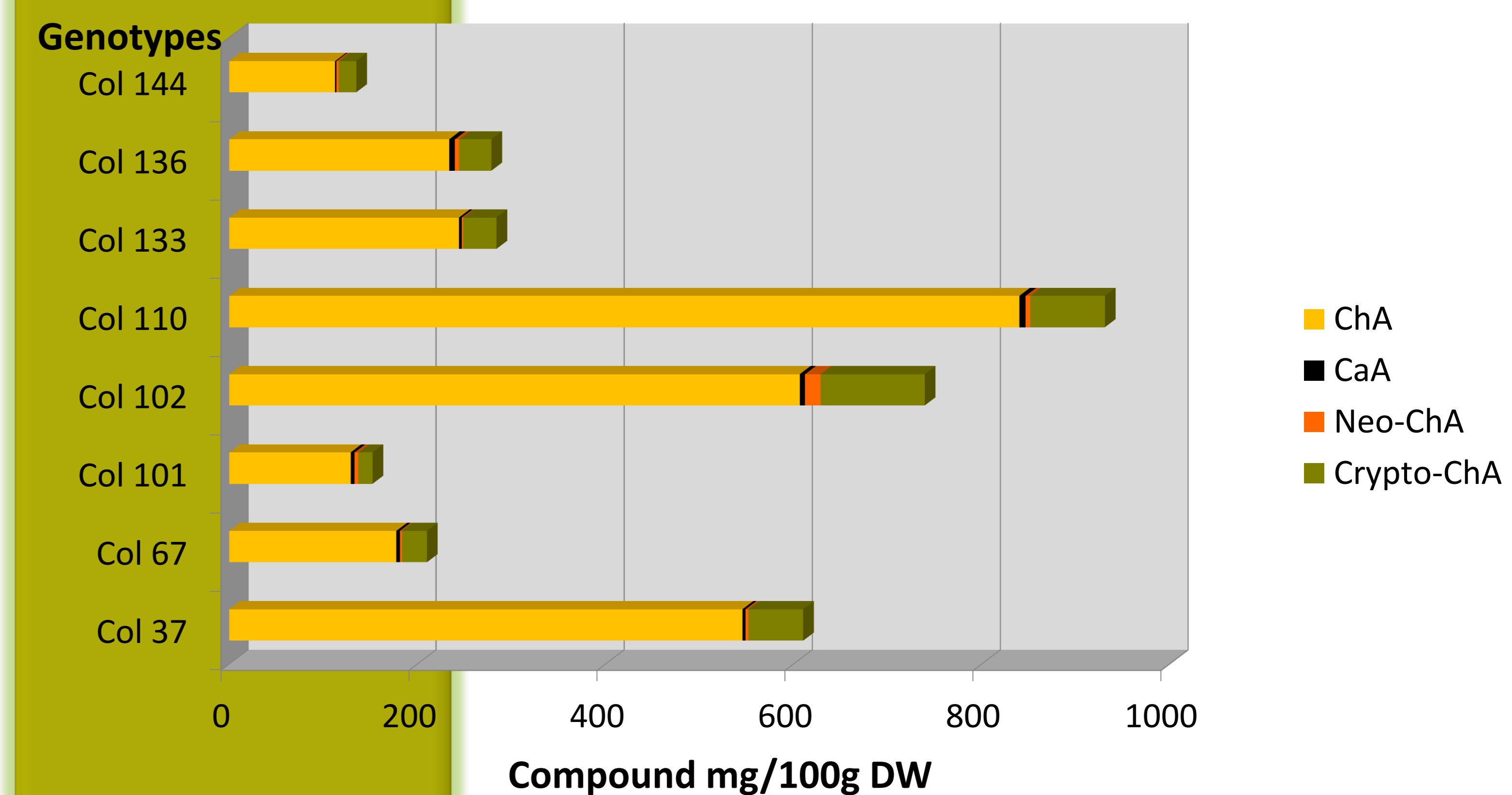


Figure 2. Concentration of non-ACN-HCA-LC in eight boiled potato genotypes from Phureja group. Chlorogenic acid (ChA), *neo*-ChA, *crypto*-ChA, and caffeic acid (CaA).

Conclusion

The increased availability of non-ACN-HCA-LC evaluated after cooking, evidenced in the amount extracted, is related to varietal response. The genotype dependency on the increase in non-ACN-HCA-LC might be used as a guide in yellow-national potato breeding programs seeking greater nutritional spectrum.

Acknowledges



MinAmbiente
Ministerio de Ambiente
y Desarrollo Sostenible



Contract to access genetic resources RGE0069