

Physical and Microscopical Characteristics of Wheat (*Triticum aestivum* L.) Grains Four New Cultivars and Their Fungal Deterioration Susceptible Sites

¹Silva, N.C.; ¹da Silva, B.A.; ²Cardoso, A.M.; ¹Tribuzi, G.; ¹Scussel, V.M.

¹Food Science and Technology Department, Center of Agricultural Sciences; UFSC; ²Vegetable Classification Department, Integrated Agricultural Development Company of Santa Catarina - CIDASC, Admar Gonzaga av., Itacorubi, Florianópolis, Brazil.

Wheat (*Triticum aestivum* L.) is the 2nd world most produced cereal, after maize, grown in countries of cold weather (China/Russia/Canada/USA). Brazil is the 15th producer, as its climate is mainly warm (tropical & subtropical), being only the Southern region (Temperate Zone) able to produce it, with part of Southeastern too. The country mostly depends upon imports from South (Argentina/Uruguay) and North America (Canada/USA). Studies have been carried out to develop new cultivars adapted to country's environment (able to grow healthy and resistant for preventing diseases) and improve production. Aim: to evaluate four new cultivars (from Campos Novos Cooperative, SC State, Southern Brazil) regarding grains anatomical & tissues microstructures differences on resistance/susceptibilities sites for fungi conidia exposure/entrance/proliferation by high resolution microscopy. Each cultivar (Audaz–A, Sintonia–Si, Sossego–So, Toruk–T) specifics were evaluated through physical (size/shape/tips/colour) and microscopical (pericarp/endosperm/germen/brush - tissues & layers) methods by applying stereo (SM) and scanning electron (SEM) [x7000] microscopies. Grains cultivars characteristics varied on *length & width* from So>Si>T>A to T>Si>A>So; *shape*, from typical oval (A&T), long & narrow (So) to flattened (Si) format; *tips*: the upper end (Tip1-brush) of cultivars A/So/T were roundish, being Si slightly flattened, as so, its lower end (Tip 2-germen) structures that may allow humidity absorption and conidia deposition. Regarding microstructures: Faces A&B had pericarp rather thick, tissue layers resistant and protective to damages, membrane walls showing strip lines at Face B (ventral area) - the crease (forming a deep valley-pigment strand). It divides grain in two parts (the checks). At Tips 1&2, SEM showed details on brush (conidia adhered onto hair follicles) and

Controle

germen (nutrient rich with an inner tight small cavity - the micropyle) sites. Therefore, the main wheat features (susceptible site) that allow fungi conidia deposition and/or moisture absorption, which leads to fungi deterioration were: the brush, crease & micropyle sites. A few cultivars samples present brush & germen *flattened shapes* that allows fungi conidia, with hyphae & mycelia proliferation too. The main factors affecting wheat production are the diseases (caused by field and storage fungi) and high humidity exposure, thus it is necessary to have resistant cultivars and so control methods. Knowledge on different cultivars morpho-histological sites of conidia entrance is a must to understand grain deterioration susceptibilities, for further mitigation procedures development thus quality and safety improvement. This work is part of a Project on cashew nut shell liquid (CNSL) natural/GRAS control methods development.

Key words: microstructures, SEM, fungi, wheat, susceptible sites