

Detection and Enumeration of Mycofloral Populations Associated with Ethiopian Arabica Coffee Bean Contamination

G. ADUGNA¹, H. NIRENBERG², H. HINDORF³

¹Ethiopian Institute of Agricultural Research, Jimma Agricultural Research Center,
P. O. Box 192, Jimma; Ethiopia. Email: gadugna@yahoo.com

²Biologische Bundesanstalt für Land- und Forstwirtschaft, Institut für Virologie und
Mikrobiologie, Königin-Luise-Str. 19, D – 14195 Berlin, Germany

³Institut für Pflanzenkrankheiten, Universität Bonn, Nussallee 9, D – 53115 Bonn, Germany

SUMMARY

Ethiopia is the country with the longest tradition of coffee production and consumption in the world that witnessed by unique Ethiopian ‘coffee ceremony’. The country is also the oldest exporter of world’s finest original coffee. Although most coffee is exported as sun dried (natural), the amount of high quality wet processed (washed) Arabica coffee has been tremendously increasing since the 1990s. There have been enormous concerns about mycotoxin especially ochratoxin A (OTA) contamination associated with severe mould development in coffee. Consequently, great deals of research and extension efforts are being underway globally on mould management. In this regard, Ethiopian coffee farmers are strongly advised to adopt good harvesting and drying practices to improve quality and reduce mould contamination. Nevertheless, except few flying publications, baseline information is either lacking or scanty hitherto about mould contamination of Ethiopian Arabica coffee. In an attempt to address and tackle this prominent issue, investigations were undertaken to detect and enumerate mould species associated with Arabica coffee, determine their distribution and relative importance in the country. Three sample components; viz. coffee cherries fallen and dried on the ground, cherries dried on the tree and wet processed parchment coffee, were structured in 3 locations namely, Gera, Jimma and Teppi (each with distinct agroecological zone) in major coffee belts of Ethiopia. The former two sample groups meant to represent bulk of the traditional sun dried coffee production while the latter constituted the wet processing method. Accordingly, about 300 cherries/parchments were randomly collected, dehulled and then plated following two standard procedures (agar plate and blotter methods) after surface disinfection. The experiment was repeated at least twice during the main harvesting seasons for two consecutive years. The isolated species identification was confirmed at BBA, Berlin, Germany. The result showed that seven major fungal species belonging to the genera *Aspergillus* (6) and *Penicillium* (1) were detected in the different coffee samples. The enumerated mycofloral populations turned to vary significantly across the sample components and geographic origins of coffee. *Aspergillus phoenicis* was abundantly isolated from coffee cherries dried on the tree and in wet processed parchment coffee from Gera and Jimma. While *A. parasiticus* was the dominant mould species (81.5%) detected in coffee samples fallen and dried on the ground at Teppi. *A. melleus* found in high proportion (87.5%) in fallen coffee beans, and in moderate percentage (45%) in dried coffee samples collected from the tree at Jimma. *Penicillium stoloniferum* was recorded most frequently in coffee samples collected at Gera followed by Teppi. The present findings revealed that the presence of different mould populations associated with Ethiopian coffee beans not reported elsewhere and interestingly, the most toxigenic species, *A. ochraceus* was not encountered.