The chocolate obtained with cocoa in full sun agroforestry system are different that all the shady systems. The agroforestry system have an important impact on aroma composition of cocoa beans and their contents determined. Compounds were then classified in chemical families.

**Plant Material**

One cocoa variety "Trinitario" type coming from Cameroun was used. It is also named "cacao Allemand" in located place. Three types of agroforestry system were characterized: full sun, lightly and strongly shaded.

**Post-harvest processing conditions**

Fermentation was carried out in wooden cubic boxes for 6 days. Every 24 hours, 1 kg fresh cocoa was sampled and sun dried. The dried beans were transferred to France and stored at -20°C until analysis.

**Protocol**

About 100 g of unshelled dried cocoa were ground in blender (SEB, France) under liquid nitrogen, sifted to 0.5 mm and stored at -20°C prior to analysis. The volatiles compounds were extracted by SPME fiber (DVB/Carboxen/PDMS) on 2.7 g of cocoa powder. Analysis and identification of cocoa flavour compounds were carried out by CP6-SIM (Agilent 6890 and 5973 N). The biochemical composition of purines, procyanidines, dry matter, fat content and ammonia nitrogen content was determined with NIRS analysis [1,2]. The cocoa beans were also used to make chocolate and realized sensory analysis with a trained panel.

**Aroma compounds**

Flavour compounds of all the dried cocoa samples were identified and their contents determined. Compounds were then classified in chemical families. 52 compounds, belonging to 11 chemical families, were identified in the cocoa beans. Esters (16), alcohols (12), aldehydes (7) and ketones (5) were the main families.

A statistical analysis (ACP, figure 1) was carried out to characterize the impact of shade conditions on the volatile compound contents.

**Results and discussion**

Flavour compounds were analyzed by sensory analysis. A statistical analysis (PCA, figure 3) was carried out to characterize the impact of shade conditions on sensory perception of chocolate.

**Biochemical composition**

A statistical analysis (Anova) carried out on the biochemical composition showed that only contents of procyanidines B1 and C1 and the ammonia nitrogen content were significantly different in relation with shade level. A PCA on these data (figure 2) showed a good separation between the samples in full sun system and the others. The first axe was correlated positively with the content of procyanidines contents and negatively with the ammonia nitrogen content. The second axe was correlated positively with ammonia nitrogen contents.

**Conclusion**

- The agroforestry system have an important impact
  - On aroma composition of cocoa beans and roasted beans (data not shown),
  - On procyanidines and ammonia nitrogen content of cocoa beans,
  - On the sensorial perception of chocolate.

- The chocolate obtained with cocoa in full sun agroforestry system were characterized with a sweet taste and a global quality more important than shady system.

- The full sun system are different that all the shady systems.