

Design of Sheller and optimization of working parameters



In order to improve the performance of [mustard sheller](#), increase the shelling rate and reduce the breakage rate of tea seeds, the physical parameters of mustard and the working principle and structural characteristics of common sheller were studied. A mustard sheller with adjustable shelling clearance was designed based on the principles of extrusion and rubbing. The orthogonal optimization experiment was carried out by choosing three factors: the speed of the shelling motor, the speed of the separating motor and the clearance of the shelling, and taking the shelling rate and the teaseed breakage rate as the indexes.

At present, some research results have been achieved. For example, Tang Xiang and others have studied mustard husking device. The device consists of feeding hopper, shelling device, [microwave drying machinery equipment](#), frame and so on. It uses impact and rubbing. The working principle of the brush is shelling through the impact of the vertical throw plate and the rubbing of the toothed ring in the shelling chamber. However, the equipment can only be applied to the shelling of *Camellia oleifera* fresh fruit with moisture content less than 65%, and the shelling rate is low, 85.3%.

The results showed that the average moisture content of newly harvested mustard was 60.08%, and the particle size distribution ranged from 20 mm to 50 mm. The optimal speed of the motor is 125 r/min, the speed of the separator is 343 r/min, and the clearance is 12 mm. Under these parameters, the rate of shelling is 96.91%, the rate of tea seed damage is 3.38%, and the processing capacity can reach 2 t/h. The research can meet the actual production requirements and provide reference for processing barley.

Mustard tea shell contains no fat, and its existence is unfavorable to the preparation of tea seed oil, so it needs to be shelled. At present, there are only scattered cultivation of *Camellia oleifera* in Southeast Asia, which has not formed a certain industry, and there is no relevant research on mustard husking technology. In China, the degree of mechanization of mustard processing is still very low. The research on mustard husking began gradually around 2010.

Huang Fenghong and so on are studied by extrusion and grinding. A kind of camellia seed shelling machine is introduced. The crushing rate of camellia seed is as high as 98.5% by extrusion and rubbing between roller and cylindrical sieve plate. However, the equipment is only suitable for the shelling of Camellia seed. Lanfeng et al. developed a kind of mustard husking cleaner, which can adapt to different sizes of mustard by high-speed striking with different shelling rods with certain torsion angle and cone angle and rotation radius.

However, in practical application, the rate of husking and teaseed breakage is not ideal. The mustard sheller developed by Zhejiang Jinyun Woodrui Machinery Manufacturing Co., Ltd. uses a high-speed rotating hammer in a crushing chamber to crush mustard. Because the hammer has a very strong impact, the shelling rate is high, but the grain damage is also serious.