



## Phenotypic Characterizations of *Phytophthora infestans* in China

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Late blight, caused by *Phytophthora infestans*, is one of the most destroyed diseases of potato and tomato. Phenotypic characterizations of this pathogen (i. e. mating type, virulence and fungicide resistance) were examined in China and effect of different conditions on germination of oospores of *P. infestans* was also studied.

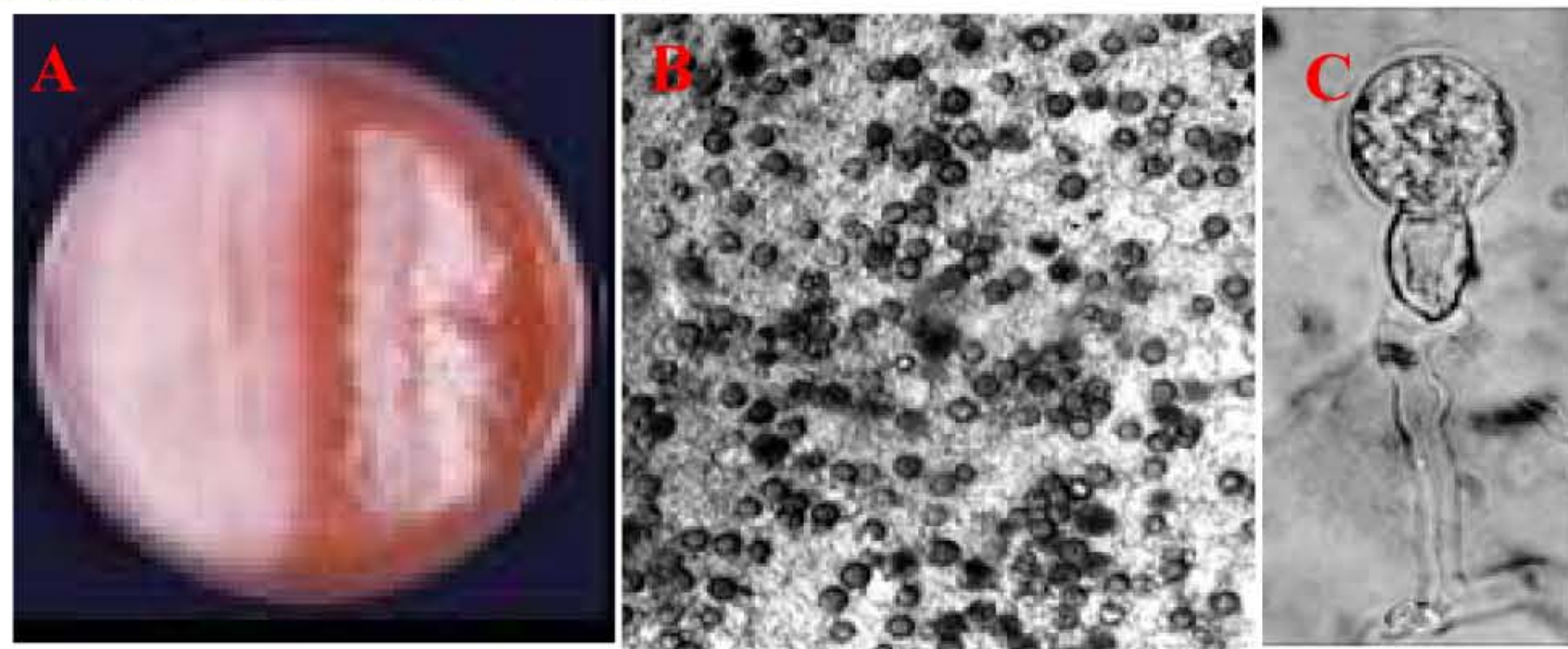


Fig. 1 Test of mating type of *P. infestans*

Mating type was determined by placing a mycelial plug of the unknown isolate culture on V8 agar plates 2 cm away from a plug of either an A1 or A2 reference isolate (cf. Fig1 A). The cultures were incubated in the dark for 15 days at 18°C, then examined microscopically for the presence of oospores in the centre of the plates where the two isolates had grown together (cf. Fig 1. B and C). A2 mating type isolates were found in four provinces of Inner Mongolia, Hebei, Yunnan, Sichuan of China from 1995 to 2007.

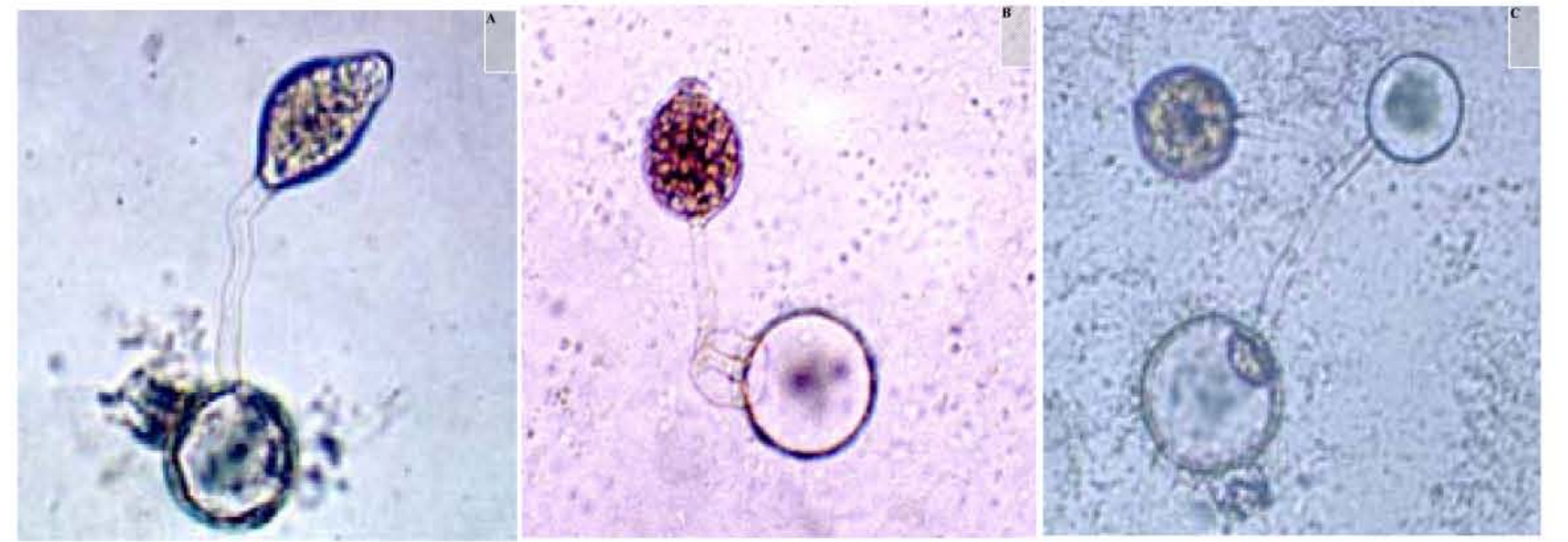


Fig 2. Modes of oospores germination of *P. infestans*

Modes of oospores germination of *P. infestans* were shown in Fig. 2. The results indicated that germination rate of oospores produced by different isolate combinations ranged from 0 to 7.2%. Germination rate of oospores reached 8.7% when two isolates of different mating types were oppositely cultivated in the same dish for 20 days and the germination rate could reach 11.4% when the oospores were incubated for 25-30 days in the agar media. The highest germination rate was 11.8% when oospores were produced in the dark condition and incubated under the light in the agar media.



Fig. 3 Test of specific virulence and race of *P. infestans*

Ninety isolates collected from 4 different provinces (Hebei, Yunnan, Sichuan, Inner Mongolia) and 1 city (Chongqing) were tested with 8 dominant mono-genes R1, R3, R4, R6, R7, R9, R10, R11 and their multi-genes potato clones of the international late blight differential host. Twenty-one different physiological races were found among 90 isolates, of which races 1.3.4.7.9.10.11 (32.2%), 1.3.4.6.7.9.10.11 (10.0%) and 3.4.7.9.11 (10.0%) dominated the population of *P. infestans* in China.



Fig. 4 Test of metalaxyl-resistance of *P. infestans*

The resistance to metalaxyl of *P. infestans* was assessed by an *in vitro* radical growth assay on fungicide-amended agar media in the four provinces of main potato production. The results showed metalaxyl-resistant isolates generally occurred and the frequencies of resistant strains were 16.7%, 24.0% and 81.5% in Sichuan, Hebei and Heilongjiang province of China, respectively. EC<sub>50</sub> values of the highly resistant and highly sensitive isolates were separately 866.4 µg/mL and 0.05262 µg/mL.