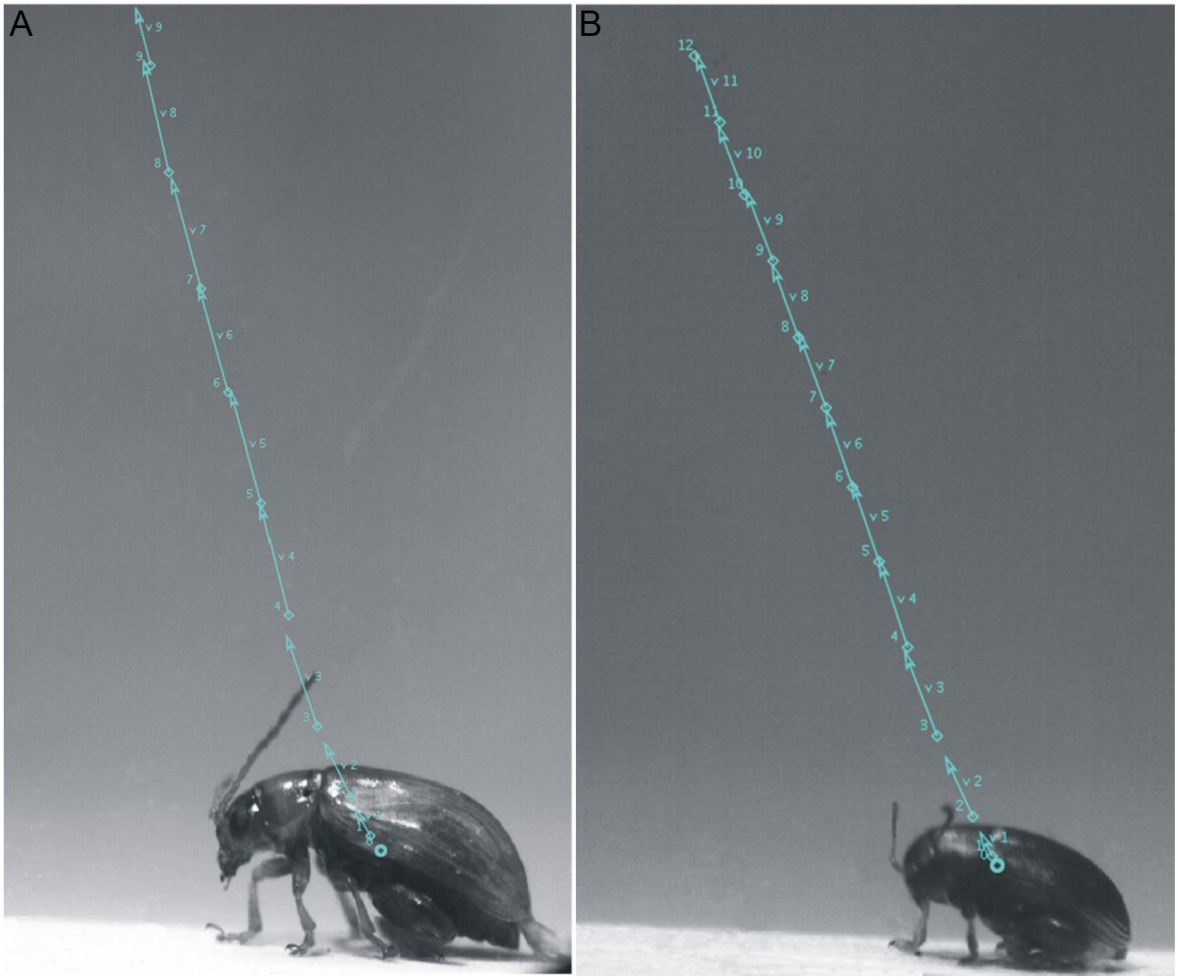

Fig. S1. (A) Trajectory of the initial phase of jump of *Aphthona cyparissiae*; arrows and numbers v1-v9 indicate the velocity vectors; rhombs and adjoined numbers indicate the frame; image was captured at a rate of 2000 frames s^{-1}. (B) Trajectory of the initial phase of jump of *Chaetocnema aridula*; arrows and numbers v1-v11 indicate the velocity vectors; rhombs and adjoined numbers indicate the frame; image was captured at a rate of 2000 frames s^{-1}.

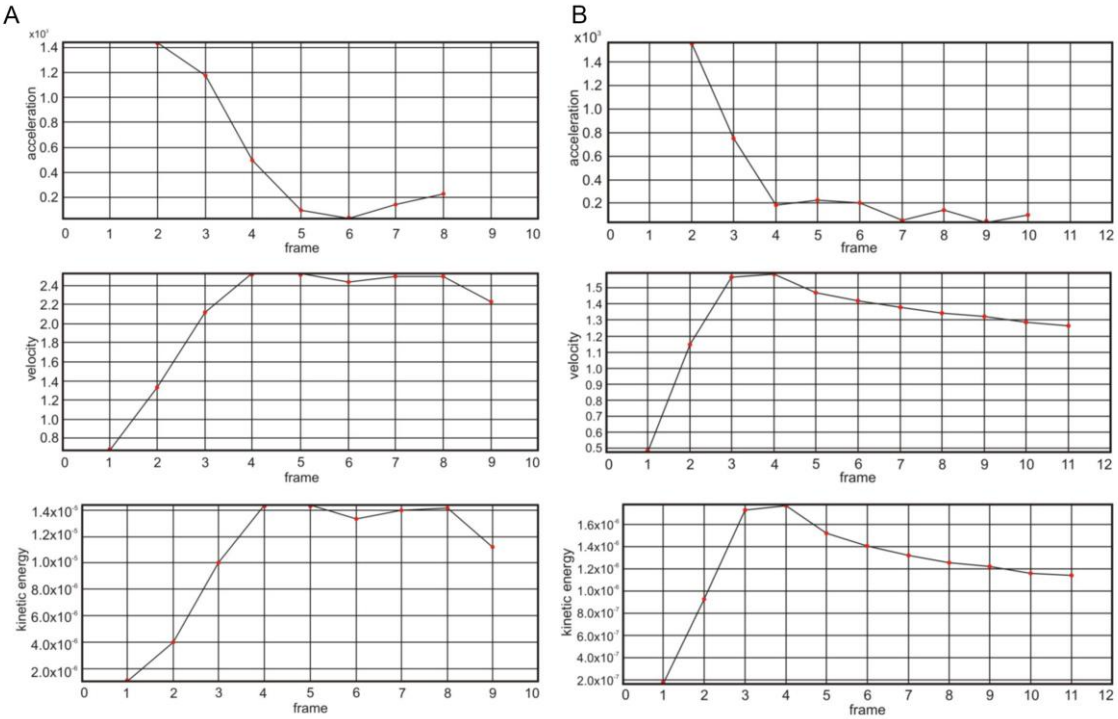

Fig. S2. Graphs of the kinematic parameters during the phases 2 and 3 of the natural jumps of flea beetles. The graphs are obtained by the software Tracker ver. 4.87 (Brown, 2015). Frames numbers are correspond to those shown at the Fig. 2A,B of the main text. (A) *Aphthona cyparissiae*. (B) *Chaetocnema aridula*.

Table S1. Mechanical quantities of jumping movement of the femoro-tibial joint of *Sphaeroderma testaceum*. The telopodite (femur + tibia + tarsus) and the extensor muscles are measured in dry mass. All calculations were made for (i) the arithmetic means, and (ii) the observed maximum value (in brackets). [1] Determined by direct measurements; [2] determined by Tracker software ver. 4.87 based on four records; all other quantities were calculated by using the given equations.

Attributes of hind leg	Performance	Power output
(1) Telopodite length[1] (m) 2.5×10^{-3}	(5) Angular velocity[2] (rad s^{-1}) 305.1 (414.1)	(10) Joint power (W) =(**5**) × (**9**) 13.5×10^{-5} (25.01×10^{-5})
(2) Telopodite mass[1] (kg) 7.0×10^{-8}	(6) Angular acceleration[2] (rad s^{-2}) = (**5**) / 0.001 s 3.05×10^{5} (4.14×10^{5})	(11) Specific joint power (W g^{-1}) =(**10**) / (**4**) 0.387 (0.714)
(3) Hind leg moment of inertia (kg m^2) = 1/3 (**2**) × (**1**)^2 1.4×10^{-13}	(7) Tangential acceleration (m s^{-2}) = (**1**) × (**6**) 763.0 (1035.3)	
(4) Extensor muscles of femur mass[1] (g) 3.5×10^{-5}	(8) Tangential acceleration in units of gravitational acceleration = (**7**) / 9.81 m s^{-2} 77.8 (105.5)	
	(9) Torque (N m) =(**3**) × (**6**) 4.45×10^{-8} (6.04×10^{-8})	